Self-Assessments
on Concept (3.1)

Self-Assessment 1 on Lesson 1

1 (A) Put (✓) or (✗) :

1. The Mars rover Curiosity converts sound energy into kinetic energy. ( )
2. Mars rover Curiosity can be operated from a distance. ( )
3. The stored energy in batteries is the light energy. ( )

(B) Give a reason for the following :

Curiosity robot uses the sunlight and batteries for its operation.

....

....

2 (A) Write the scientific term of each of the following :

1. The main source of energy on the Earth. (............)
2. The form of energy that is stored in the battery of a remote controlling toy car. (............)
3. The remote controlled vehicle used to explore the surface of planet Mars. (............)

(B) Name two devices that can be operated from a distance by using a remote control.

....

....

3 Look at the opposite figure, then choose the correct answer :

1. This car needs .... to move.
   a. water b. wood
   c. fuel d. energy
2. To keep playing with the toy car when the battery runs out, we have to .... or recharge the battery.
   a. heat b. cool
   c. replace d. freeze
3. The form of energy that is used in operating this car is .... energy.
   a. sound b. light c. thermal d. electrical

Self-Assessment 2 till Lesson 2

1 (A) Complete the following sentences :

1. When you rub your hands together, the consumed energy is .... energy, while the produced energy is .... energy.
2. The produced energy in a toy car is .... energy, while the produced energies in a hair dryer are .... energy and sound energy.
3. The produced energy from coal when burned is .... energy, that is converted into .... energy used to operate the machines of electric power stations.

(B) Give a reason for the following :

The thermal energy produced from burning coal is used in some electric power stations.

....

....

2 (A) Put (✓) or (✗) :

1. Curiosity robot needs sound energy to be operated. ( )
2. The electric lamp is the primary source of most energies on the Earth. ( )
3. The electric iron converts electrical energy into thermal energy. ( )

(B) What happens to ...?

The change of energy when you press on the spring of the soap dispenser.

....

....

3 Look at the opposite figure, then complete the following sentences :

1. This living organism can convert .... energy of the Sun into .... energy stored inside it.
2. If the wood of this organism is burned, ... energy is produced.
3. After death and burying of this organism over millions of years, it becomes coal that stores .... energy.
4. The formed coal can be used in electric power stations to generate .... energy.

Self-Assessment 3 till Lesson 3

1 (A) Choose the correct answer :

1. Mars rover Curiosity uses .... to be operated.
   a. solar energy and electrical energy
   b. solar energy and thermal energy
   c. electrical energy and thermal energy
   d. electrical energy and sound energy
2. While playing a drum, ... energy is converted into .... energy.
   a. sound – kinetic
   b. sound – light
   c. kinetic – sound
   d. kinetic – light
3. In a bicycle, a part of kinetic energy is converted into .... energy due to the friction of its tires with the road.
   a. sound   b. thermal
   c. light   d. chemical

(B) What happens to ...?

The change of energy when you rub your hands together.

....

....

2 (A) Correct the underlined words :

1. Energy can neither be created nor destroyed, but only converted from one form to another, this is the law of consuming of energy. (............)
2. The consumed energy while burning some pieces of wood is the thermal energy. (............)
3. The lighted lamp produces chemical energy that makes you feel warmth when you put your hands near it. (............)

(B) Mention two devices that convert electrical energy into both kinetic and sound energy.

....

....

3 Look at the following figures, then complete the following sentences :


Device (1)


Device (2)


Device (3)


Device (4)

1. The electrical energy used to operate devices number .... , ... and ....
2. Kinetic energy is produced in devices .... and ....

Self-Assessment 4 till Lesson 4

1 (A) Complete the following sentences :

1. The output energy of burning coal is .... energy, which is used to produce .... energy in electric power stations in order to generate electrical energy.
2. The output energy that helps the washing machine to do its main function is .... energy, and this energy is considered the .... energy of the hand bell.
3. The input energy of the toy car is .... energy that is stored in its battery and then converted into .... energy in its wires to operate its motor.

(B) Give a reason for the following :

Sound energy and thermal energy are considered as wasted energy in the vacuum cleaner.

....

....

2 (A) Write the scientific term of each of the following :

1. The input energy of a television. (..................)
2. The wasted energy in a computer. (..................)
3. The output energy of the washing machine which helps it do its main function. (..................)

(B) Mention the input and output energies of the opposite device :



Electric iron

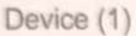
1. Input energy : ....

2. Output energy : ....



3 Look at these electric devices, then complete the following sentences :





Device (1)



Device (2)



Device (3)

1. Sound and light energies are produced in the device number .... and help it do its function.
2. Kinetic energy is produced in devices number .... and ....
3. Noise from devices number .... and .... is wasted energy, because sound doesn't help the devices do their functions.
4. All of these devices are operated by .... energy that is transmitted from .... stations through wires.

Model Exam
on Concept (3.1)

Total mark

20

1 (A) Choose the correct answer : (5 marks)

1. Mars rover Curiosity is designed to explore the ....
   a. planet Earth. b. planet Mars.
   c. Sun. d. moon.
2. Plants can convert the light energy from the Sun into .... energy which is stored inside the plant in the form of sugar.
   a. sound b. electrical
   c. chemical d. kinetic
3. When a piece of coal is burned, ... energy is produced.
   a. thermal b. kinetic
   c. sound d. potential
4. Inside a light bulb, electrical energy is converted into .... and .... energies.
   a. sound – light
   b. sound – thermal
   c. kinetic – light
   d. light – thermal

(B) What happens if ...?

You put your hands near a lighted lamp.

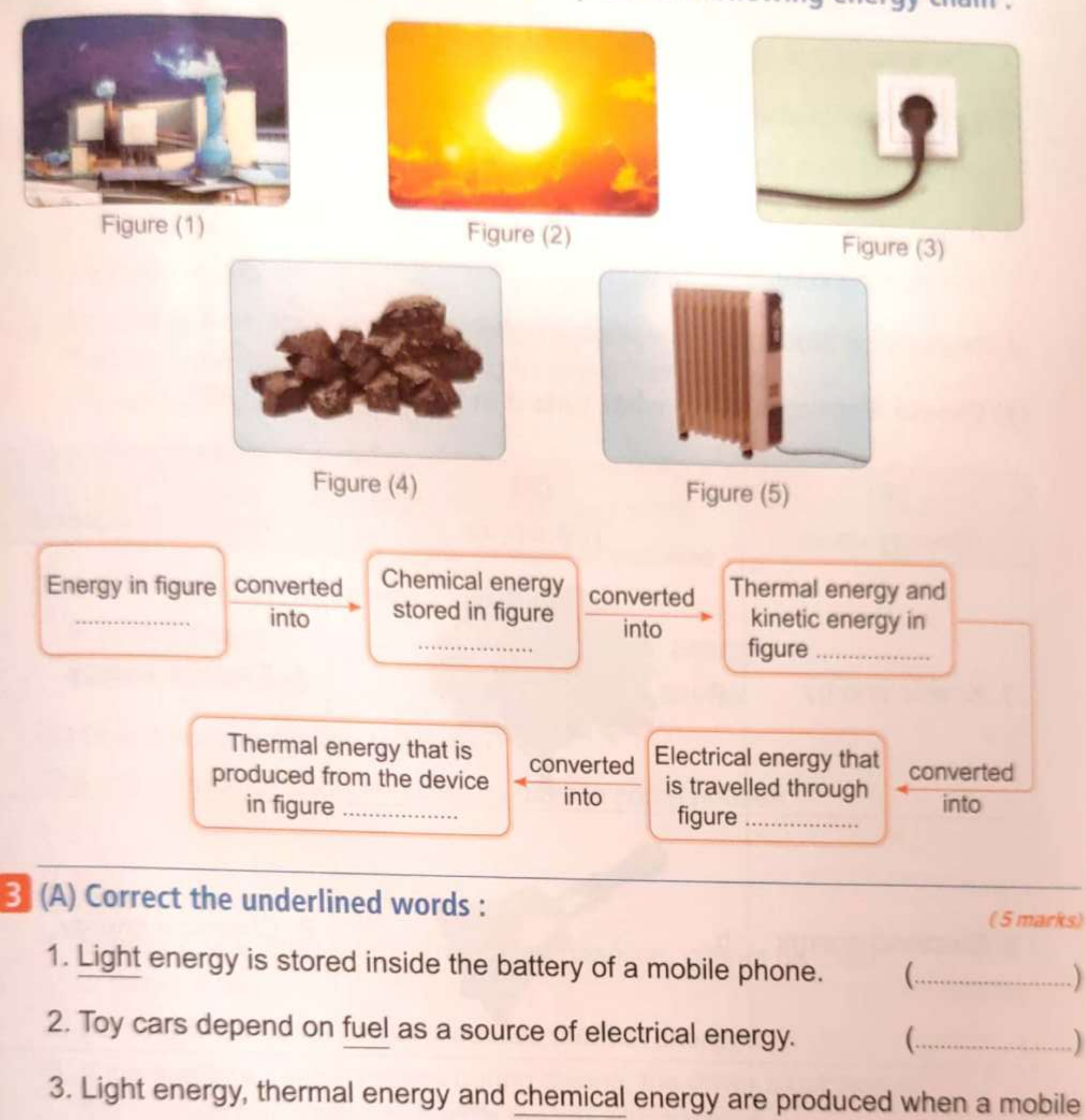
....

....

2 (A) Put (✓) or (✗) : (5 marks)

1. There is stored chemical energy inside the food we eat. ( )
2. The input energy in a hair dryer is the chemical energy. ( )
3. As a result of friction between bike's tire and the road, kinetic energy changes into chemical energy. ( )
4. We can convert the solar energy into different forms of energy. ( )

(B) Look at the following figures, then complete the following energy chain :



3 (A) Correct the underlined words :

(5 marks)

1. Light energy is stored inside the battery of a mobile phone. (..........................)
2. Toy cars depend on fuel as a source of electrical energy. (..........................)
3. Light energy, thermal energy and chemical energy are produced when a mobile phone is used. (..........................)
4. The solar energy produced from the moon can be converted into different forms of energy. (..........................)

(B) Give a reason for the following :

When you press on the spring of soap dispenser, the soap moves upward.

(according to the change of energy).

....

....

4 (A) Write the scientific term of each of the following :

1. The energy that is used to operate a television. (..................)
2. Energy can neither be created nor destroyed, but only converted from one form to another. (..................)
3. A kind of energy that is produced from the electric heater and burning coal. (..................)
4. The energy produced from playing guitar. (..................)

(B) Choose from column (A) what suits it in both columns (B) and (C) :

(A) Energy used	(B) The device	(C) Energy Produced
1. Kinetic energy	a.	A. Thermal energy.
2. Electrical energy	b.	B. Chemical energy.
3. Solar energy	c.	C. Sound energy.

1. .... → .... 2. .... → .... 3. .... → ....

Self-Assessments

on Concept (3.2)

Self-Assessment 5 on Lesson 1

1 **(A) Choose the correct answer :**

1. To move a car, the fuel must be .... the car engine at first.
   a. freezed inside b. cooled inside
   c. burned inside d. removed from
2. On driving a car for a very long distance, which of the following sentences describes the most important thing for the driver ? ....
   a. The presence of passengers.
   b. The presence of a radio.
   c. The fuel tank is completely filled with gasoline.
   d. The fuel tank contains a little amount of gasoline.
3. On burning fuel, we obtain ....
   a. sound energy. b. potential energy.
   c. electrical energy. d. thermal energy.

(B) Give a reason for the following :

The importance of wood and coal as fuels in some houses.

....

2 **(A) Put (✓) or (X) :**

1. Energy that is produced from burning gasoline, cannot be used to move a car. (   )
2. Burning of all forms of fuel produces thermal energy. (   )
3. If the fuel in a car decreases during driving, the driver must stop at the nearest fuel station to supply the car with gasoline. (   )

(B) Mention three different forms of fuel.

....

....

3 **Put each of the following words in front of the suitable sentence :**

[The Sun – Wood – Gasoline – Thermal energy]

1. It is a form of fuel that is used in different means of transportation. (..................)
2. It is a form of fuel that is used in warming houses. (..................)
3. It is a form of energy which is produced from burning fuel. (..................)
4. The main source of most energies on the Earth's surface. (..................)

Part 1

Self-Assessment 6 till Lesson 2

1 (A) Choose the correct answer :

1. Car engines can be operated by ....

   a. coal only. b. coal and wood.

   c. gasoline only. d. gasoline and natural gas.

2. Fossil fuels were formed under the Earth's surface from dead plants or animals, after a .... period of time.

   a. very short b. short c. very long d. long

3. The two main types of fuel are ....

   a. wood and coal. b. water and wind.

   c. the Sun and the moon. d. fossil fuels and biofuels.

(B) Give a reason for the following :

Biofuel is considered as a renewable fuel.

....

2 (A) Put (✓) or (✗) :

1. Coal can be used to produce electrical energy. ( )
2. Coal, gasoline and wood are considered as renewable resources of energy. ( )
3. The nonrenewable resources of energy include coal, gasoline and water. ( )

(B) What happens if ...?

Sea creatures were buried under the Earth's surface over millions of years.

....

3 Choose from column (B) what suits it in column (A) :

(A) Form of fuel	(B) We can get it from
1. Wood	a. wood chips and grass.
2. Oil	b. cutting of trees.
3. Coal	c. decomposition of sea creatures underground.
4. Liquid biofuels	d. decomposition of plants remains underground.
	e. boiling water.

1. .... 2. .... 3. .... 4. ....

Self-Assessment 7 till Lesson 3

1 (A) Choose the correct answer :

1. To produce steam inside the electric power station, we have to ....
   a. cool water. b. freeze water.
   c. heat water. d. cool fuel.
2. The devices in the electric power station which operated by steam are called ....
   a. generators. b. turbines.
   c. tubes. d. wires.
3. The generator inside the electric power station, turns ....
   a. water into steam. b. steam into water.
   c. electrical energy into kinetic energy.
   d. kinetic energy into electrical energy.

(B) What happens if ...?

A generator in an electric power station is damaged.

....

2 (A) Put (✓) or (✗) :

1. When fuel is burned, it produces thermal energy. ( )
2. Turbines convert kinetic energy into electrical energy. ( )
3. The electrical energy produced from electric power station can be used in houses, streets and factories. ( )

(B) Complete the following sentences by choosing the correct answer from those between brackets :

1. Fossil fuels are [nonrenewable – renewable] resources of energy which can be used to generate electrical energy.
2. Turbines in electric power stations are operated by the effect of [steam – sand].
3. Electrical energy travels from electric power stations to houses through [cars – wires].

3 From your understanding of how electricity is generated in electric power stations. Put each of the following words in front of its suitable sentence :

[Coal – Steam – Turbine – Generator]

1. Its movement produces kinetic energy. (..................)
2. It changes kinetic energy into electrical energy. (..................)
3. It is a type of nonrenewable resources of energy. (..................)
4. It is resulted from heating the water and it turns turbines. (..................)

Self-Assessment 8 till Lesson 4

1 (A) Choose the correct answer :

1. When carbon dioxide gas in air increases, the Earth's temperature ....
   a. decreases slowly. b. increases slowly.
   c. decreases fastly. d. doesn't change.
2. All forms of fossil fuel are formed ....
   a. above the Earth's surface. b. under the Earth's surface.
   c. above the water surface. d. in the air around us.
3. We have to protect rocks of buildings from ....
   a. global warming. b. oxygen gas.
   c. acid rain. d. carbon dioxide gas.

(B) Give a reason for the following :

Burning of coal and oil causes the increase of the Earth's temperature.

....

....

2 (A) Put (✓) or (✗) :

1. Acid rain causes global warming. ( )
2. Mixing of water with oxygen gas produces acid rain. ( )
3. Acid rains have negative effects on both soil and water of lakes. ( )

(B) What happens to ...?

The people's health if they live in a city that has too much cars smog.

....

3 Scientists do some experiments to know the bad effects of some different sources of pollutions on living organisms.
Match each experiment with its correct observation :

The experiment	The observation
1. Exposing a dog to cars smog for a few minutes	a. its leaves turn brown and it will die.
2. Placing a building rock in a cup contains a sample of acid rain for a long period of time	b. irritation of its eyes and lungs.
3. Watering a small plant with acid rain for a week	c. it will decompose into small rocky particles.

1. .... 2. .... 3. ....

Self-Assessment 9 till Lesson 5

1 (A) Choose the correct answer :

1. The energy that originally causes the formation of fuels is ....
   a. wind energy. b. water energy.
   c. solar energy. d. electrical energy.
2. As the time passes, the amount of coal will ....
   a. increase. b. decrease.
   c. remain constant. d. increase then decrease.
3. Burning of fossil fuels produces ....
   a. only gases that pollute the air.
   b. only thermal energy.
   c. gases that pollute the air and solar energy.
   d. thermal energy and gases that pollute the air.

(B) Give a reason for the following :

Burning fossil fuels causes global warming.

....

....

2 (A) Put (✓) or (✗) :

1. Renewable forms of fuel can be replaced faster than nonrenewable forms of fuel. ( )
2. Burning of fossil fuels produces gases that don't cause global warming. ( )
3. Burning coal releases gases which cause air pollution. ( )

(B) What happens to ...?

The Earth's temperature if the amount of gases produced from burning of fossil fuels increases to very high limit.

....

....

3 Complete the following paragraph by using the following words :

[global warming – heat – raises – gases]

From disadvantages of using fossil fuels is that when they are burned, they release .... that cause air pollution and trap .... in the atmosphere, which .... the temperature on the Earth, that causes .... and changes the Earth's climate.

Model Exam

on Concepts (3.1) & (3.2)

Total marks
20

1 (A) Choose the correct answer : (5 marks)

1. A form of biofuels which can be used in warming houses and cooking food is ....
   a. wood. b. wind.
   c. water. d. sand.
2. You feel warm when you rub your hands together, because .... energy converts into thermal energy.
   a. kinetic b. light
   c. electrical d. sound
3. All the following are from the harmful effects of acid rain, except ....
   a. the death of trees.
   b. the change in the chemical nature of soil.
   c. the increase in the Earth's temperature.
   d. the change in the chemical nature of lakes.
4. A form of fossil fuels that was formed from the decomposition of plant remains is ....
   a. wind. b. coal.
   c. wood. d. sand.

(B) Give a reason for the following :

A remote controlled toy car needs a battery to move from one place to another.

....

....

2 (A) Put (✓) or (✗) : (5 marks)

1. Grass and wood chips can be used to make a liquid fuel. ( )
2. When pedalling a bike, the chemical energy in your body changes into kinetic energy. ( )
3. The movement of a turbine in the electric power station produces chemical energy. ( )
4. Energy may be destroyed inside different devices. ( )

(B) What happens if ...?

Pesticides mix with water of canals and rivers.

....

3 (A) Write the scientific term of each of the following : *(5 marks)*

1. The main source of most forms of energy on the Earth's surface. (....................)
2. The energy stored inside the coal. (....................)
3. The energy resources that include wind energy, water and solar energy. (....................)

(B) Correct the underlined words :

1. The amount of biofuels cannot be replaced as quickly as it is used. (....................)
2. Curiosity is a robotic vehicle that is designed to explore the surface of moon. (....................)

---

4 (A) Complete the following sentences : *(5 marks)*

1. The change of electrical energy into sound energy in the radio is an example that proves the law of ....
2. The generator in the electric power station changes .... energy into .... energy.
3. In any energy chain, some of the energy is wasted in the form of ....

(B) Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Oil 2. Charcoal 3. Acid rain	a. it is a form of biofuels that is made from wood. b. it is formed when oxygen gas combines with water. c. it is a form of fossil fuels that was formed from the decomposition of sea animals. d. it is formed when carbon dioxide gas combines with water in the air.

1. .... 2. .... 3. ....

Choose the correct answer:

1. An electric lamp changes electric energy into .... energy.
   a. sound energy b. light energy
   c. kinetic energy d. solar energy
2. The .... changes electric energy into heat energy.
   a. electric iron b. radio
   c. TV d. cellular phone
3. The .... changes electric energy into light and sound energies.
   a. cellular phone b. TV
   c. radio d. a & b
4. Sound energy is produced from all the following devices, except the ....
   a. cellular phone b. TV
   c. radio d. electric iron
5. Light energy is produced from all the following devices, except the ....
   a. cellular phone b. TV
   c. radio d. electric lamp
6. Solar cells change solar energy into ....
   a. electric energy b. heat energy
   c. sound energy d. kinetic energy

7. .... produce electric energy.

a. Electric irons
b. Electric heaters
c. Solar cells
d. Motors

8. .... consume electric energy.

a. Solar cells
b. Batteries
c. Solar heaters
d. Cellular phones

9. Heat energy is .... in the solar heater.

a. consumed
b. produced
c. lost
d. destroyed

10. Electric energy is .... in the electric heater.

a. consumed
b. produced
c. lost
d. destroyed

11. All these devices consume electric energy, except the ....

a. cellular phone
b. solar cell
c. radio
d. TV

12. The .... contains chemical energy.

a. solar heater
b. battery
c. radio
d. TV

13. Calculators can be operated by using ....

a. solar energy
b. electric energy
c. heat energy
d. sound energy

14. A gas oven can be operated by using ....

a. solar energy
b. electric energy
c. heat energy
d. natural gas

15. A/An .... is operated by electricity.

a. TV
b. electric heater
c. radio
d. all the following

16. The distance between Earth and Mars is .... million kilometers.
    a. 54 b. 55
    c. 44 d. 45

17. Curiosity is the most famous .... on Mars.
    a. application b. spacecraft
    c. robot d. rocket

18. Robots and vehicles are operated by.......... .
    a. electric chargers b. long-term batteries
    c. solar panels d. b & c

2 Put (✓) or (✗):

1. Energy can't be changed from one form to another. ( )
2. Electric lamps consume electric energy. ( )
3. Solar energy is the energy consumed in solar cells. ( )
4. TV and cellular phones produce light energy. ( )
5. TV and radios consume sound energy. ( )
6. Solar energy is converted into electric energy in solar cells.( )
7. Batteries produce chemical energy. ( )
8. Calculators can be operated by using solar energy. ( )
9. Curiosity Robot is one of the most famous robots on Mars.( )
10. Robots obtain electricity from solar panels and electric chargers. ( )

3 Fill in the gaps using the following words:

(electric – heat – chemical – consumed – produced – TV – Solar cells)

1. .... produce electric energy.
2. The .... produces sound energy.
3. Solar energy is the energy .... in solar cells.
4. Electric energy is the energy .... in solar cells.
5. Electric irons consume .... energy and produce .... energy.
6. The devices contain batteries that contain .... energy.

4 Write the scientific term:

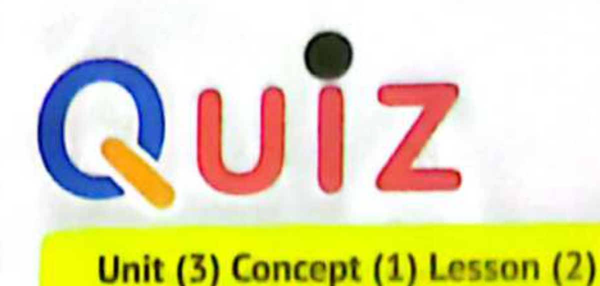
1. Energy produced from solar cells. (....................)
2. Energy consumed by solar heaters. (....................)
3. A device that changes electric energy into sound energy. (....................)
4. A device that changes electric energy into heat energy. (....................)
5. A device that changes solar energy into electric energy. (....................)
6. A device that changes solar energy into heat energy. (....................)
7. They contain chemical energy that changes to electric energy. (....................)

5 Complete the following:

1. ………………, ……………… and ……………… produce sound energy.
2. ………………, ……………… and ……………… produce light energy.
3. Electric energy is ……………… in cellular phones while it is ……………… in solar cells.
4. ……………… change solar energy into electric energy.
5. Cellular phones change ……………… energy into ……………… and ……………… energies.
6. ……………… change chemical energy into electric energy.
7. Spacecrafts needs more than ……………… months to reach Mars.
8. Vehicles on Mars change solar energy into ………………, ……………… and ……………… energies to operate their ……………… to move on Mars.
9. Robots are very far away from any ……………… and ……………… .
10. Devices use ……………… as a source of energy.

6 Classify the following devices according to devices need for solar energy or electric energy:

Devices that need solar energy	Devices that need electric energy
………………………………	………………………………
………………………………	………………………………



Unit (3) Concept (1) Lesson (2)

1 Choose the correct answer:

1. Energy is very important for most devices to ....
   - a. operate
   - b. do their functions
   - c. move
   - d. all the following
2. When batteries run out, devices ....
   - a. operate
   - b. move
   - c. stop
   - d. do their functions
3. Batteries store .... energy to operate devices.
   - a. electric
   - b. chemical
   - c. heat
   - d. kinetic
4. To make batteries work again, we must ....
   - a. charge it
   - b. change it
   - c. burn it
   - d. a & b
5. The main source of energy in all devices is the ....
   - a. Sun
   - b. wind
   - c. water falls
   - d. coal
6. Any energy chain .... with the Sun.
   - a. ends
   - b. stops
   - c. starts
   - d. no correct answer
7. During running, ... energy stored in food changes to kinetic energy.
   - a. electric
   - b. heat
   - c. chemical
   - d. sound



8. We burn trees to get .... energy.

a. heat
b. electric
c. chemical
d. sound

9. A hair dryer changes electric energy into .... energy.

a. kinetic
b. sound
c. heat
d. all the following

10. .... is used in electric power stations to produce electricity.

a. Food
b. Coal
c. Water
d. No correct answer

11. The input energy in mobile phones is (are) ....

a. electric
b. sound
c. light
d. b & c

12. It is .... to operate any device without the Sun.

a. possible
b. impossible
c. acceptable
d. no correct answer

13. When you rub your hands, kinetic energy changes to .... energy.

a. light
b. sound
c. heat
d. electric

14. The .... is used to move things.

a. dynamo
b. motor
c. hair dryer
d. electric heater

15. The .... is used to obtain electricity.

a. dynamo
b. motor
c. hair dryer
d. electric heater

16. Driving a bike changes the .... energy inside the human body into kinetic energy.

a. heat
b. chemical
c. potential
d. kinetic

17. .... change electric energy into kinetic energy.

a. Fans
b. Motors
c. Washing machines
d. All the following

18. Motors .... electric energy.

a. consume
b. produce
c. lose
d. no correct answer

19. Heat energy is .... in the electric iron.

a. consumed
b. resulting
c. lost
d. destroyed

20. Toy cars change .... energy into kinetic energy.

a. sound
b. heat
c. elastic potential
d. electric

2 Put (✓) or (✗):

1. Any energy chain starts with the Sun. ( )
2. When a battery runs out, we must charge it. ( )
3. Batteries store electric energy. ( )
4. During running, chemical energy changes to kinetic energy. ( )
5. A hair dryer changes electric energy into heat energy only. ( )
6. Coal is used in electric power stations to get electricity. ( )
7. Small watches are used to know time. ( )

8. Kinetic energy is produced in motors. ( )
9. Heat energy is resulted from dynamos. ( )
10. Small watches consume heat energy. ( )

3 Write the scientific term:

1. It is the energy stored in batteries. ( )
2. The main source of energy. ( )
3. The output energy in the electric iron. ( )
4. The output energy in the small watch. ( )
5. A device used to move things. (.................)
6. A device used to get electricity. (.................)
7. A device used to light houses. (.................)
8. A device used for drying hair. (.................)
9. A device used to transfer image and sound. (.................)

4 Complete the following:

1. Energy makes devices .... and ....
2. Batteries store .... energy that is used to operate ....
3. When batteries run out, we must .... or .... them.
4. During running, the .... energy stored in the human body changes to .... energy.
5. .... is used in electric power stations to produce electricity.
6. Any energy chain starts with the ....

6 Arrange the following energy chains from the start to the end:

1 During running:


Chemical energy


Kinetic energy


Solar energy

2 In heating water:


Cutting trees


Burning wood


Solar energy

3 In mobile phones:


Light & sound energies


Coal


Sun


Cutting trees


Battery in mobile


Electric Power Stations



Unit (3) Concept (1) Lesson (3)

1 Choose the correct answer:

1. During ...., chemical energy changes to kinetic energy
   a. running b. reading
   c. driving a bike d. a & c

2. On driving a bike, a part of the kinetic energy changes to .... energy due to the friction between the wheel and the road.
   a. heat b. sound
   c. light d. potential

3. .... convert electric energy to light energy.
   a. Fans b. Batteries
   c. Electric bulbs d. Bikes

4. You feel .... when you approach your hand to an electric bulb.
   a. cold b. hot
   c. happy d. angry

5. Which of the following statements is correct?
   a. Energy can't be changed from one form to another.
   b. Energy can be changed from one form to another.
   c. Energy may be lost or destroyed.
   d. Energy can be created.

6. "Energy is saved", this is known as the ....
   a. Law of Conservation of Energy
   b. Law of Attraction Force
   c. First Law of Newton   d. Second Law of Newton

2 Complete the following:

1. On running, ... energy changes to .... energy.
2. A part of the kinetic energy in a moving car changes to .... due to the friction between the .... and the ....
3. Electric lamps change .... energy to .... energy.
4. You feel .... when you approach your hand to an electric lamp.
5. Energy is neither .... nor ...., but it ....

3 Write the scientific term:

1. A device used to light houses. (................)
2. The energy stored in food. (................)
3. The energy produced due to friction. (................)
4. Energy is neither created nor destroyed. (................)

4 Put (✓) or (✗):

1. Energy can be changed from one form to another. (   )
2. You feel cold when you approach your hand to an electric bulb. (   )
3. Electric lamps convert electric energy to light energy. (   )

5 Study the opposite figure, then choose the correct answer:

1. The input energy is .... energy.
   (chemical – kinetic - electric)
2. The output energy is .... energy.
   (chemical - kinetic- electric)
3. As the speed of the car increases, its kinetic energy ....
   (increases – decreases – doesn't change)
4. The driver's body move .... when he/she stops.
   (forward – backward - upward)
5. The wheel of the car becomes .... after stopping
   (cold – hot - weak)

6 Mention the input and output energies of the following figures

Figure	Input Energy	Output Energy
1	....	....
2	....	....
3	....	....
4	....	....
5	....	....



Unit (3) Concept (1) Lesson (4)

1 Choose the correct answer:

1. The input energy in the hair dryer is .... energy.
   a. electric
   b. heat
   c. sound
   d. kinetic
2. The function of a hair dryer is ....
   a. air movement
   b. motor sound
   c. drying hair
   d. no correct answers
3. Heat energy is the .... energy in the hair dryer.
   a. input
   b. output
   c. lost
   d. no correct answers
4. Kinetic energy is the .... during running.
   a. input
   b. output
   c. lost
   d. no correct answers
5. The output energy in the hair dryer is .... energy.
   a. light
   b. sound
   c. data processing
   d. all the following

2 Complete the following:

1. The function of the hair dryer is ....
2. ...., ... and .... energies are resulted in a hair dryer.
3. ...., ... and .... energies are resulted in a mobile phone.
4. Electric energy is the .... energy in mobile phones and hair dryers.

3 Put (✓) or (✗):

1. Air movement is the function of the hair dryer. ( )
2. Kinetic energy is produced in the hair dryer. ( )
3. Data processing is the output energy in mobile phones. ( )
4. Energy is always saved and not destroyed. ( )

4 Study these figures and classify the energies to input & output

Electric energy – Heat energy – Sound energy – Kinetic energy

Input Energy	Output Energy
....	....
....	....
....	....
....	....

Electric energy – Heat energy – Light energy

Input Energy	Output Energy
....	....
....	....
....	....
....	....



Unit (3) Concept (1) Lesson (5)

1 Choose the correct answer:

1. Ecologists study the flow of energy in difficult ecosystems, such as the ....
   a. North Pole
   b. bottom of oceans
   c. forests
   d. a & b

2. Any change in the flow of energy in difficult ecosystems ....
   a. causes pollution
   b. causes climate changes
   c. affects the living organisms
   d. no correct answer

3. .... design solutions for the mobile screen to obtain light energy.
   a. Ecologists
   b. Engineers
   c. Designers
   d. No correct answer

4. The mobile phone ....
   a. consume a small amount of energy in a short time
   b. consume a small amount of energy in a long time
   c. consume a large amount of energy in a short time
   d. consume a large amount of energy in a long time



2 Write the scientific term:

1. They study the flow of energy in difficult ecosystems. (..........................)

2. They modify the mobile battery to last for a longer time after charging it. (..........................)

3. Areas affected hardly by decreasing the flow of energy to it. (..........................)

3 Complete the following:

1. .... study the flow of energy in difficult ecosystems, such as .... and ....

2. Any change in the flow of energy in difficult ecosystems affects ....

3. Mobile phones consume a .... amount of energy in a .... time.

4. .... modify the mobile battery to last for a longer time after charging it.



Model Exam 1

Unit (3) Concept (1)

1 Choose the correct answer:

1. Curiosity is the most famous .... on Mars.
   a. application b. spacecraft
   c. robot d. rocket

2. To make a battery work again, we must .... it.
   a. charge b. change
   c. burn d. a & b

3. .... is used in electric power stations to produce electricity.
   a. Gasoline b. Coal
   c. Water d. No correct answer

4. Which of the following statements is correct?
   a. Energy can't be changed from one form to another.
   b. Energy can be changed from one form to another.
   c. Energy may be lost or destroyed.
   d. Energy can be created.

5. .... design solutions for the mobile screen to obtain light energy.
   a. Ecologists b. Doctors
   c. Engineers d. No correct answer

2 Write the scientific term:

1. The energy stored in food. (....................)
2. A device used to transfer images and sounds. (....................)
3. The energy produced due to friction. (....................)
4. They study the flow of energy in difficult ecosystems. (....................)

3 Complete the following:

1. Energy makes devices .... and ....
2. .... is used in electric power stations to produce electricity
3. Vehicles on Mars change solar energy into .... and .... energies to operate their .... to move on Mars.
4. You feel .... when you approach your hand to an electric lamp.

4 Put (✓) or (✗):

1. Air movement is the function of the hair dryer. ( )
2. Any energy chain starts with the Sun. ( )
3. The output energy in a mobile phone is light energy only. ( )
4. The mobile phone consume a small amount of energy in a long time. ( )

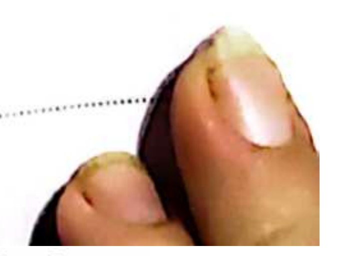
5 Complete the following table:

Figure	Input Energy	Output Energy
1	....	....
2	....	....
3	....	....

6 What is meant by:

– Law of Conservation of Energy.

....





Model Exam 2

Unit (3) Concept (1)

1 Choose the correct answer:

1. Ecologists study the flow of energy in difficult ecosystems, such as the ....

   a. North Pole   b. bottom of oceans
   c. forests   d. a & b

2. Heat energy is .... in solar heaters.

   a. consumed   b. produced
   c. lost   d. destroyed

3. All these devices consume electric energy, except ....

   a. solar cells   b. radios
   c. TV   d. mobiles

4. A hair dryer changes electric energy into .... energy.

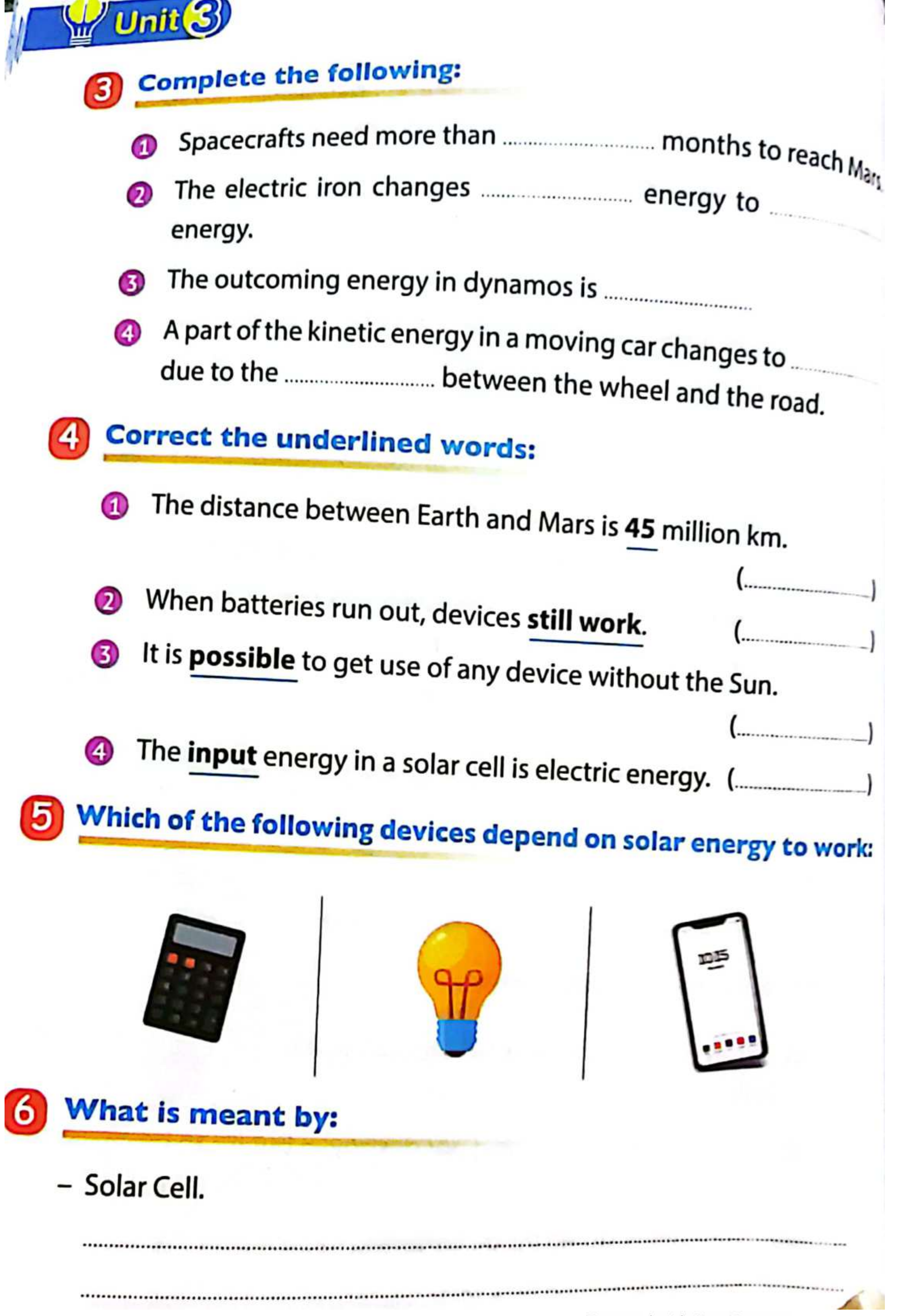
   a. kinetic   b. sound
   c. heat   d. all the following

5. .... energy is stored in trees.

   a. Solar   b. Electric
   c. Chemical   d. Potential

2 Write the scientific term:

1. They modify the mobile battery to last for longer time after charging it. (............................)
2. Energy is neither created nor destroyed but it can be changed. (............................)
3. The energy stored inside batteries. (............................)
4. Energy consumed by a solar heater. (............................)



3 Complete the following:

1. Spacecrafts need more than .... months to reach Mars.
2. The electric iron changes .... energy to .... energy.
3. The outcoming energy in dynamos is ....
4. A part of the kinetic energy in a moving car changes to .... due to the .... between the wheel and the road.

4 Correct the underlined words:

1. The distance between Earth and Mars is **45** million km. (....................)
2. When batteries run out, devices **still work**. (....................)
3. It is **possible** to get use of any device without the Sun. (....................)
4. The **input** energy in a solar cell is electric energy. (....................)

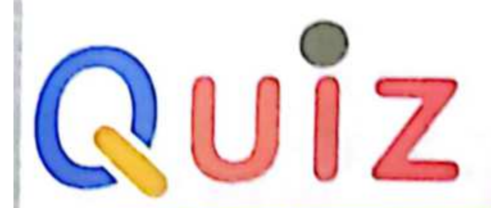
5 Which of the following devices depend on solar energy to work:

6 What is meant by:

– Solar Cell.

....

....



Unit (3) Concept (2) Lesson (1)

1 Choose the correct answer:

1. The main source of fuel is the ....
   a. wind　　b. waterfalls
   c. sun　　d. no correct answer
2. Fossil fuel is extracted from ....
   a. mountains　　b. forests
   c. rivers　　d. underground
3. Vehicles need .... to move.
   a. food　　b. fuel
   c. water　　d. no correct answer
4. .... is (are) from the importance of fuel.
   a. Operating cars　　b. Generating electricity
   c. Warming houses　　d. All the previous
5. When the fuel inside the car runs out, the car ....
   a. stops　　b. moves
   c. a & b　　d. no correct answer
6. The wheels of the car rotate when the fuel inside the car ....
   a. runs out　　b. ends
   c. burns　　d. no correct answer
7. .... is (are) from the examples of fossil fuel.
   a. Coal　　b. Natural gas
   c. Petroleum　　d. All of the previous



2 Correct the underlined words:

1. Any energy chain **ends** with the Sun. ( )
2. Fossil fuels are extracted from **mountains**. ( )
3. When fuel **burns** inside a car, the car stops. ( )
4. When fuel runs out, the car **moves**. ( )
5. Petroleum is an example of **biofuel**. ( )

3 Complete the following:

1. Any energy chain starts with the ....
2. ...., ... and .... are examples of fossil fuel.
3. The wheels of the car .... when fuel burns inside the car engine.
4. The car stops, when the fuel ....
5. ...., ... & .... are from the importance of fossil fuel.

4 Write the scientific term:

1. It burns inside the car engine to make the car move. ( )
2. The main source of fuel. ( )

5 What is the importance of:

1. Fossil fuel.

....

2. Fuel.

....



Unit (3) Concept (2) Lesson (2)

1 Choose the correct answer:

1. Burning fuel produces .... energy.
   a. electric b. kinetic
   c. potential d. heat
2. .... is the oldest fuel that is used all over the world.
   a. Coal b. Wood
   c. Petroleum d. Natural gas
3. .... is a non-renewable source of energy.
   a. Fossil fuel b. Biofuel
   c. Sun d. Wind
4. .... is the fuel made of living organisms that can be planted.
   a. Fossil fuel b. Biofuel
   c. Petroleum d. Gasoline
5. .... is an example of biofuel.
   a. Petroleum b. Coal
   c. Corn d. Natural gas
6. .... is (are) example (s) of fossil fuel.
   a. Petroleum b. Coal
   c. Natural gas d. All the following
7. From the disadvantages of the overuse of fossil fuel is (are) ....
   a. cutting trees b. removal of forests
   c. air pollution d. a & b
8. From the disadvantages of biofuel is (are) ....
   a. cutting trees b. removal of forests
   c. air pollution d. a & b

9. The rate of the consumption of fossil fuel is .... the rate of its formation.

a. more than b. less than
c. equal to d. no correct answer

10. .... is produced from the decomposition of plants or trees.

a. Petroleum b. Natural gas
c. Coal d. Benzene

11. .... is (are) produced from the decomposition of old aquatic organisms.

a. Petroleum b. Natural gas
c. Coal d. a & b

12. .... takes millions of years to be formed.

a. Fossil fuel b. Biofuel
c. Charcoal d. No correct answer

13. Ethanol is produced from ....

a. grass b. corn
c. coal d. a & b

14. Global warming is one of the disadvantages of burning ....

a. biofuel b. petroleum
c. coal d. b & c

15. All the following are non-renewable sources of energy, except ....

a. coal b. wood
c. petroleum d. benzene

16. All the following are renewable sources of energy, except ....

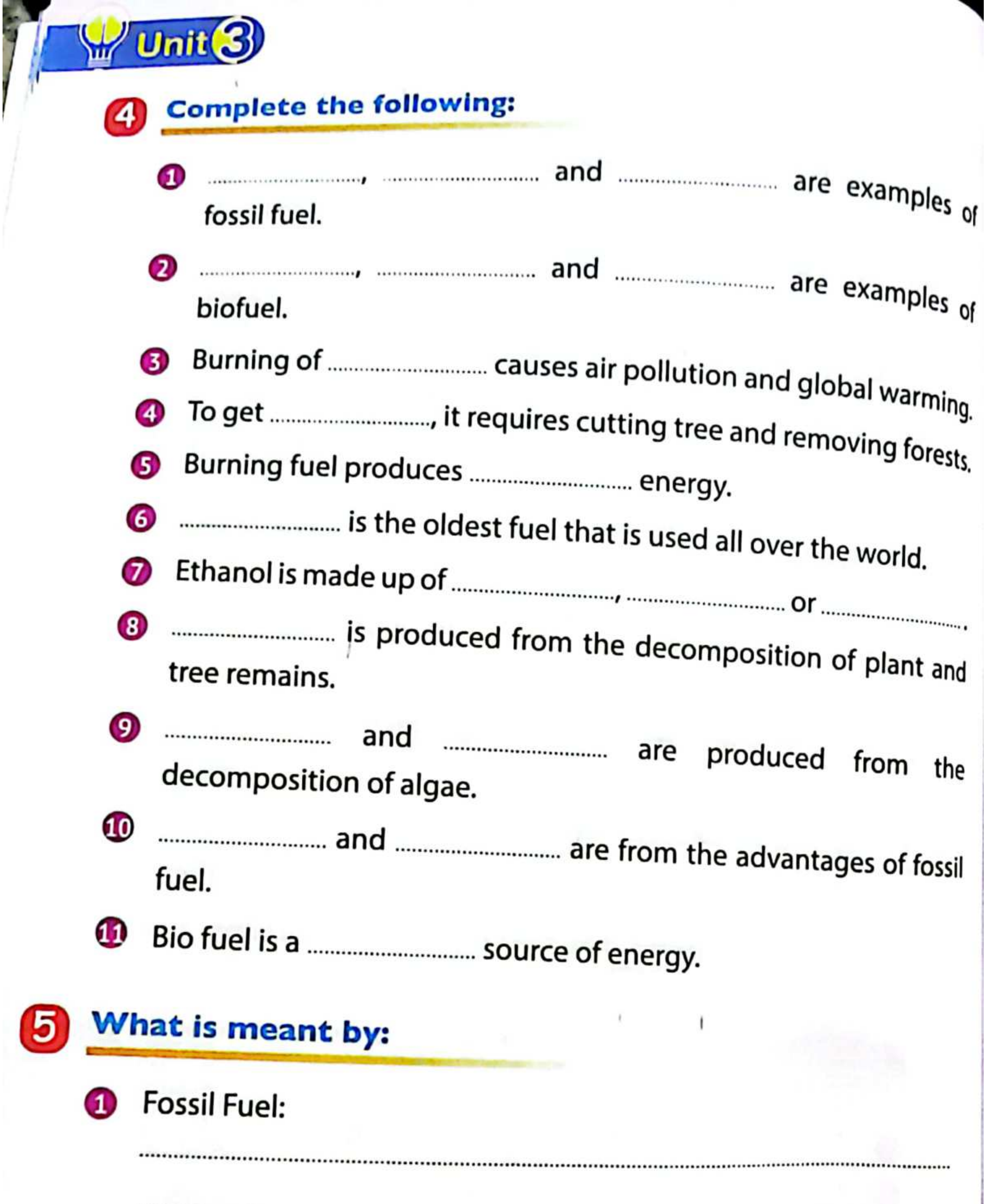
a. corn b. wood
c. petroleum d. grass

2 Correct the underlined words:

1. **Coal** is the oldest fuel that is used all over the world. (..........................)
2. Burning fuel produces **light** energy. (..........................)
3. **Petroleum** is a renewable source of energy. (..........................)
4. **Corn** is a non-renewable source of energy. (..........................)
5. **Charcoal** is made up of grass, corn or wood chips. (..........................)
6. To get **fossil fuel**, it requires cutting trees & removing forests. (..........................)
7. **Petroleum** is produced from the decomposition of tree remains. (..........................)
8. **Coal** is produced from the decomposition of algae. (..........................)
9. Burning of **biofuel** causes air pollution & global warming. (..........................)

3 Write the scientific term:

1. It is the fuel resulting from the decomposition of the remains of living organisms that lived on the earth millions of years ago. (..........................)
2. It is the fuel made from the living organisms that can be grown. (..........................)
3. It is made up of grass, corn or wood chips. (..........................)
4. A Biofuel that made up of wood. (..........................)
5. It is produced from the decomposition of plant and tree remains. (..........................)
6. It is produced from the decomposition of marine organisms. (..........................)



4 Complete the following:

1. ……………………, …………………… and …………………… are examples of fossil fuel.
2. ……………………, …………………… and …………………… are examples of biofuel.
3. Burning of …………………… causes air pollution and global warming.
4. To get ……………………, it requires cutting tree and removing forests.
5. Burning fuel produces …………………… energy.
6. …………………… is the oldest fuel that is used all over the world.
7. Ethanol is made up of ……………………, …………………… or …………………….
8. …………………… is produced from the decomposition of plant and tree remains.
9. …………………… and …………………… are produced from the decomposition of algae.
10. …………………… and …………………… are from the advantages of fossil fuel.
11. Bio fuel is a …………………… source of energy.

5 What is meant by:

1. Fossil Fuel:

……………………………………………………………………………………

……………………………………………………………………………………

2. Biofuel:

……………………………………………………………………………………

……………………………………………………………………………………

6 Label the following figures, then classify them into biofuel or fossil fuel:

Figure	Represents	Biofuel	Fossil fuel
1	Wood	✓	....
2	....	....	....
3	....	....	....
4	....	....	....
5	....	....	....

7 Give reason for:

1. Fossil fuel is a non-renewable source of energy.

   ....

   ....

2. Biofuel is a renewable source of energy.

   ....

   ....



Unit (3) Concept (2) Lesson (3)

1 Choose the correct answer:

1. The remains of old organisms are buried under ....
   a. rocks b. sediments
   c. a & b d. no correct answer
2. Under the effect of high ...., the remains of old organisms are transferred to fossil fuel.
   a. temperature & pressure
   b. temperature & force
   c. temperature & energy
   d. no correct answer
3. .... is (are) burnt and producing high heat energy.
   a. Petroleum b. Natural gas
   c. Coal d. All the previous
4. .... moves the turbines in electric power stations.
   a. Air b. Steam
   c. Water d. No correct answer
5. Electricity transfers through .... wires to cities.
   a. long & huge b. long & thin
   c. short & huge d. short & thin

2 Complete the following:

1. The remains of old organism are buried under .... and ....
2. Under the effect of high .... and ...., the remains of old organism change into ....

3. Electricity is generated by burning .... or .... in electric power stations.
4. The petroleum or natural gas is burnt and produces .... energy.
5. .... starts to move turbines in electric power stations.
6. A dynamo converts .... energy in the turbines into .... energy.

3 Write the scientific term:

1. It the energy produced from burning fossil fuels. (....................)
2. The device which changes kinetic energy into electric energy. (....................)

4 These steps represent the generation of electricity in electric power stations. Arrange the following steps from the start to the end:

- Steam starts to move turbines.
- The petroleum or natural gas burns and produces thermal energy.
- Electricity transfers through huge wires to cities.
- The dynamo converts kinetic energy in turbines into electric energy.
- Thermal (heat) energy is used to heat water and produce steam.

....

....

....

....

....



Unit (3) Concept (2) Lesson (4)

1 Choose the correct answer:

1. Petroleum oil is considered as a .... source of energy.
   a. permanent b. renewable
   c. non-renewable d. no correct answer
2. Water is considered as a .... source of energy.
   a. permanent b. renewable
   c. non-renewable d. no correct answer
3. The amount of .... is limited on Earth.
   a. biofuel b. fossil fuel
   c. a & b d. no correct answer
4. To reduce air pollution, we must ....
   a. walk instead of driving cars
   b. use public transportation
   c. turn off lamps if we don't need them
   d. all the previous
5. The rate of consumption of fossil fuel is .... the rate of its formation.
   a. more than b. less than
   c. equal to d. no correct answer
6. Petroleum is formed from the decomposition of ....
   a. bacteria b. diatom algae
   c. fungus d. euglena



2 Complete the following:

1. The amount of fossil fuel is .... on Earth.
2. The rate of formation of petroleum is .... than the rate of its consumption.
3. The chemical structure of water and petroleum are ....
4. Petroleum is formed from the decomposition of old marine organisms called ....
5. Diatom algae is very .... organism, smaller than the head of a ....
6. Water is considered as a .... source of energy.

3 Put (✓) or (✗):

1. Water is a non-renewable source of energy. (   )
2. The chemical structure of water and petroleum is different. (   )
3. The amount of petroleum on Earth is limited. (   )
4. We must light up electric bulbs and electric devices if we don't need them. (   )

4 Write the scientific term:

1. They are very tiny organisms, smaller than the head of a pin. (....................)
2. The amount of it on Earth is limited. (....................)

5 Give reason for:

1. Water is a renewable sources of energy.

....

....

2. Petroleum is a non-renewable sources of energy.

....

....

6 How to reduce the burning of fossil fuel:

1. ....
2. ....
3. ....

7 How to reduce the consumption of water:

....

....

....

....

Model Exam 1

Unit (3) Concept (2)

1 Choose the correct answer:

1. Fossil fuel is extracted from ....
   a. mountains b. forests
   c. rivers d. underground earth
2. .... is the oldest fuel that used is all over the world.
   a. Coal b. Wood
   c. Petroleum d. Natural gas
3. .... is an example of biofuel.
   a. Petroleum b. Coal
   c. Corn d. Natural gas
4. .... moves the turbines in electric power stations.
   a. Air b. Steam
   c. Water d. No correct answer
5. Petroleum is formed from the decomposition of ....
   a. bacteria b. diatom algae
   c. fungus d. euglena

2 Write the scientific term:

1. It the energy produced from burning fossil fuel. (..................)
2. The amount of it on Earth is limited. (..................)
3. It is made up of grass, corn or wood chips. (..................)
4. The main source of fuel. (..................)

3 Complete the following:

1. Any energy chain starts with the ....
2. ...., ... and .... are from the importance of fossil fuel.

3. To get ……………… , it requires cutting trees and removing forests.
4. The remains of old organisms are buried under rocks and ……………… .

4 Correct the underlined words:

1. **Coal** is the oldest fuel that is used all over the world. (………………)
2. To get **fossil fuel**, it requires cutting trees & removing forests. (………………)
3. The **physical** structure of water and petroleum is different. (………………)
4. We must **light up** electric bulbs and electric devices if we don't need them. (………………)

5 What is meant by:

- Diatom Algae

……………………………………………………………………………………

……………………………………………………………………………………

6 Give reason for:

- Biofuel is a renewable source of energy.

……………………………………………………………………………………

……………………………………………………………………………………

7 What is the importance of:

- Dynamo

……………………………………………………………………………………

……………………………………………………………………………………



Model Exam 2

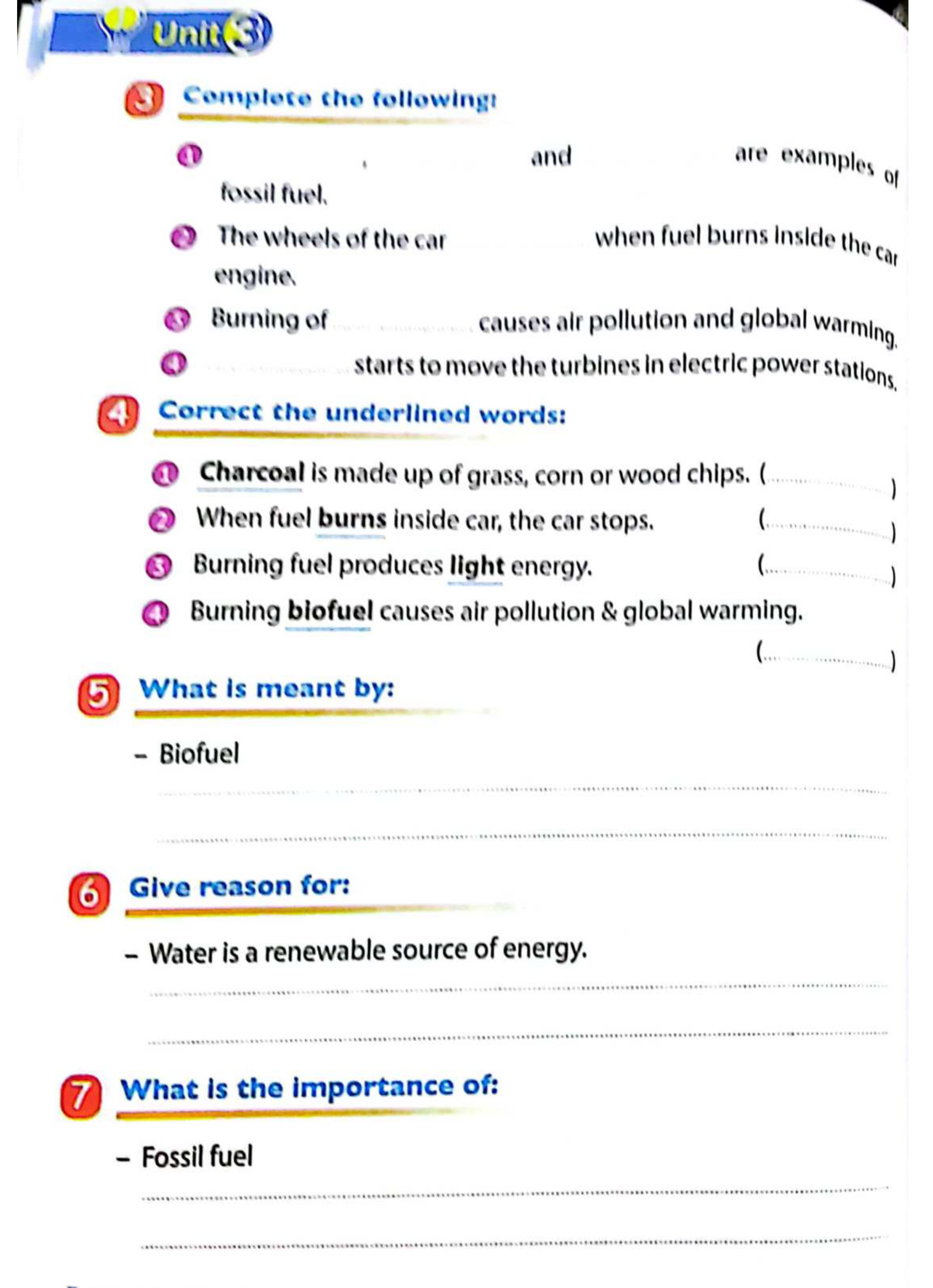
Unit (3) Concept (2)

1 Choose the correct answer:

1. The wheels of the car rotate when the fuel inside the car ....
   a. runs out b. ends
   c. burns d. no correct answer
2. .... Is produced from the decomposition of plants or trees.
   a. Petroleum b. Natural gas
   c. Coal d. Benzene
3. Ethanol is produced from ....
   a. grass b. corn
   c. coal d. a & b
4. The remains of old organisms are buried under ....
   a. rocks b. sediments
   c. a & b d. no correct answer
5. Water is considered as a .... source of energy.
   a. permanent b. renewable
   c. non-renewable d. no correct answer

2 Write the scientific term:

1. The device which changes kinetic energy into electric energy. (............)
2. They are very tiny organisms, smaller than the head of a pin. (............)
3. It is produced from the decomposition of plant and tree remains. (............)
4. It burns inside the car engine to make the car move. (............)



3 Complete the following:

1. ...., ... and .... are examples of fossil fuel.
2. The wheels of the car .... when fuel burns inside the car engine.
3. Burning of .... causes air pollution and global warming.
4. .... starts to move the turbines in electric power stations.

4 Correct the underlined words:

1. **Charcoal** is made up of grass, corn or wood chips. (................)
2. When fuel **burns** inside car, the car stops. (................)
3. Burning fuel produces **light** energy. (................)
4. Burning **biofuel** causes air pollution & global warming. (................)

5 What is meant by:

- Biofuel

....

....

6 Give reason for:

- Water is a renewable source of energy.

....

....

7 What is the importance of:

- Fossil fuel

....

....



Concept 3-1 Devices and energy

The law of conservation of energy : Energy can neither be created nor destroyed, but only converted (change) from one form of energy into another.

Device	**Function**	**Consumed (input) (used) energy**	**Produced (output) energy**
Hair dryer	Dry our hair	Electrical energy through wire (cord)	Thermal, sound and kinetic energies
Soap dispenser	Moves the soap to your hand	Potential energy (stored in the spring)	Kinetic energy (the movement of soap upward)
Washing machine	Washes our cloth	Electrical energy	Kinetic, thermal and sound energies
fan	Produce fresh air	Electrical energy	Kinetic energy and sometimes thermal and sound







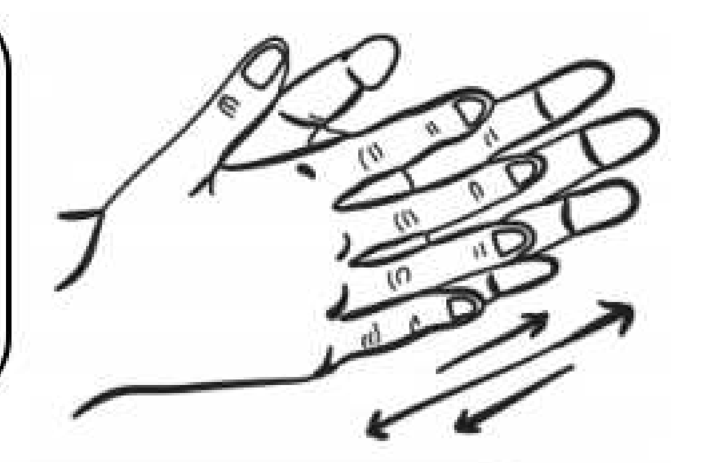
Blender	Mix food	Electrical energy	Kinetic energy + sound energy
Television	Showing us movies	Electrical energy	Light ,sound and sometimes thermal and kinetic energies
Electric bulb and table lamp	Lighting up	Electrical energy	Light and thermal energies
Hand held fan	Providing cooling effect	Chemical energy	Kinetic energy and when the fan moves it will produce sound energy
Dynamo	Generate electricity	Mechanical energy (kinetic)	Electrical energy

Battery powered clock	Showing the time	Chemical energy	Kinetic and sound energies
Flash light	Lighting up	Chemical energy	Light and thermal energies
Hand bell	Alerting	Kinetic energy	Sound energy (when the bell rings)
Electric heater	Warming	Electrical energy	Thermal energy
Drums	Providing music	Kinetic energy	Sound energy
Calculator (use solar panel)	make some calculations	Solar energy	Electrical energy



Iron	Remove wrinkles.	Electric energy	Thermal energy (heat)
Speakers	Provide sounds	Electric energy	Sound energy and sometimes kinetic energy.
Motor of a toy car (uses battery)	Make the toy car move	Chemical energy	Kinetic energy and sometimes thermal.
Calculator uses battery	make some calculations	Chemical energy	Electrical energy

Hand rubbing changes the kinetic energy into thermal energy



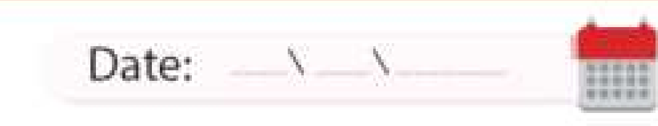
Energy chain: it is the flow of energy from one level (the source) to another level.

And it often start with the sun, as most of energy is made inside the sun.

. (we can see the pass of energy from the sun to different devices(path tracking).







Ex1) Energy chain when eating food.



The sun emits (produce) light energy causes the growth of trees

→ The plant converts light energy into stored chemical energy in form of sugar.

→ When we eat, we will take this stored energy inside our body and change it into kinetic energy when we move.

Ex 2) Energy chain when heating a pot of water over a fire.

The sun emits (produce) light energy, causes the growth of trees

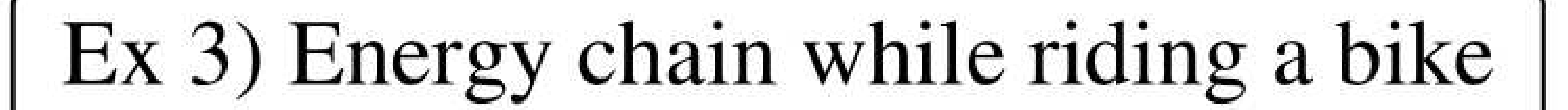
→ The tree converts light energy into stored chemical energy in form of sugar.

→ When we burn the wood of the trees it will produce thermal energy which heats the water inside the pot.









إهداء الأستاذ/أحمد بدير عبد العاطى

Ex 3) Energy chain while riding a bike

The sun emits (produce) light energy, causes the growth of trees

→ The plant converts light energy into stored chemical energy in form of sugar.

↓ When we eat, we will take this stored energy inside our body and change it into kinetic energy when we ride the bike and push the pedals causes the bike to move. and also thermal energy due to the friction between the tire and the road

Ex4) Energy chain in a hair dryer



The sun emits (produce) light energy, causes the growth of trees

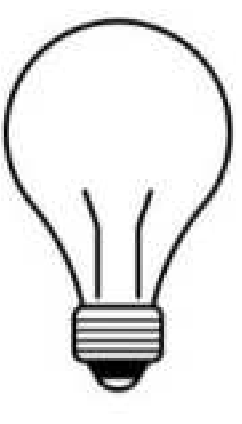
→ Coal which produced from dead trees millions years ago.(storing chemical energy)

↓ Is used in electric power stations (power plants) to be burnt (change chemical energy) and produce thermal (heat energy) to power certain devices.

← Then the thermal energy is converted into kinetic energy

This kinetic energy will operate devices to generate electrical

↓ This electrical energy goes through electric copper wires to reach the hair dryer to be operated (produce thermal , kinetic and sound energies).



Ex5) Energy chain when a light bulb is switched on

After the same part of (Ex4) When you turn on a light bulb, The electrical energy goes through electric copper wires to reach the light bulb and changes into light and thermal energy

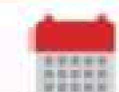
Ex6) Energy chain in the mobile phone

After the same part of (Ex4) when we recharge it with electrical energy it will be stored inside the battery as chemical energy

This chemical energy will change into light energy when it illuminates and sound energy when it rings ,and sometimes thermal energy when the phone is heated up and kinetic energy when the phone vibrate.

Ex7) Energy chain in remote- controlled cars

Many toys like (cars, trucks, planes… etc.) maybe operate remotely by a remote and this car needs battery and this battery needs to be recharged (by connecting (plug) the device to recharger or change the batteries) so after the same part of (Ex4) when we recharge it with electrical energy it will be stored inside the battery as chemical energy

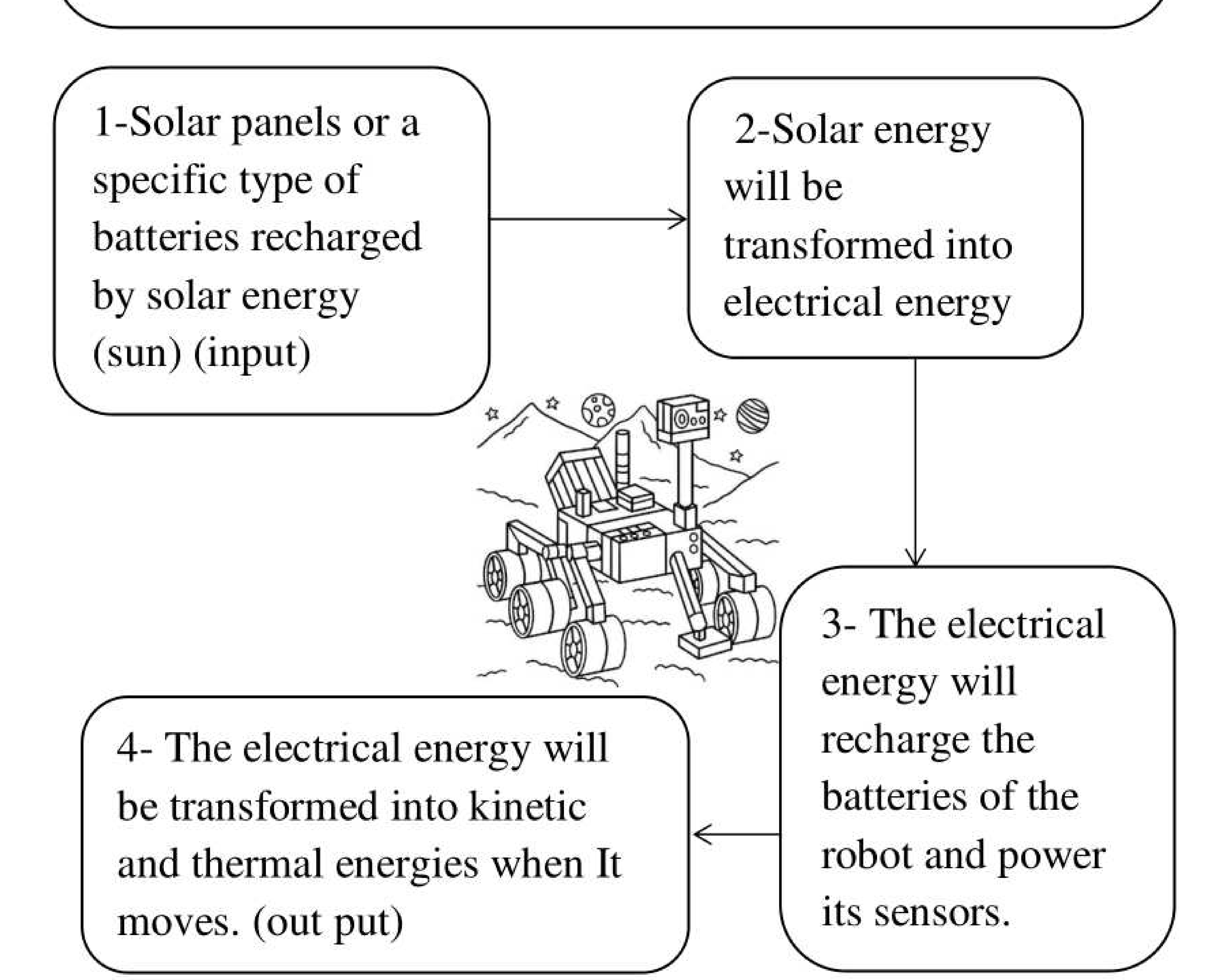




Ex8) Energy chain in Mars exploration rover

-It's about 54 million km from Earth to mars planet and the spacecraft will take 6 months to reach there.

- We send missions with a remotely operated vehicles or robots (Mars rover curiosity) (Mars exploration rover) (Curiosity exploration rover)







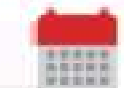
-Some of output energies do not help the device to operate and do its function called (wasted energy) foe example the output energies of a hair dryer are thermal and kinetic (useful to operate the device) but the sound energy do not help it (wasted energy)

- Some of the produced energy escape or leaks out (do not help the device like heat as not all the input energy converted into operated output energy.

So Most devices depend on electricity, which is generated from the energy of the sun in different ways as we see, but if the device depends on a rechargeable battery, so the electrical energy will be stored inside it in form of chemical and when we operate the device it will change the chemical into electrical to operate the device

(electrical(input energy) ☚ chemical☚ electrical☚ output energy (depends on the device)), and when the device depends on a non- rechargeable battery, so it has a stored electrical energy in form of chemical and when we operate the device it will change the chemical into electrical to operate the device(chemical(input) ☚electrical☚ output energy (depends on the device)).




Evaluation

Choose the correct answer:

1- It takes several …………….. for a spacecraft to travel from Earth to Mars.

a) days b) months c) hours

2- When you use the hand bell, the ……………… energy changes into sound energy.

a) kinetic b) light c) thermal

3- Plants can convert (change) the light energy from the Sun into ………… energy which is stored inside the plant in the form of sugar.

a) electrical b) chemical c) sound

4- In the washing machine, the …………….. energy changes into kinetic and sound energies.

a) electrical b) light c) potential

5- In the soap dispenser, the ………….. energy changes into kinetic energy.

a) sound b) electrical c) potential

6- Which sentence shows the energy changes in the flashlight in a correct order?

a) Chemical Electrical Light. b) Chemical Light Electrical

c) Light Chemical Electrical d) Electrical Chemical Light

7-Electric wires are made of …………..

a) copper b) wood c) glass



Put (✓) or (x):

1- Energy may be destroyed inside different devices. ( )

2-We can continue to move a toy car even after its battery run out. ( )

3- Most of the energy chains start with the moon. ( )

4-The electric fan changes electrical energy into kinetic energy. ( )

5-There is a stored chemical energy in the food we eat. ( )

6-When pedaling a bike, the chemical energy in your body changes into kinetic energy. ( )

Write the scientific term (who am i):

1-The energy that is used to operate an electric heater. (……………..)

2-It is produced from the remains of dead trees buried under the Earth's surface over millions of years. (……………..)

1- The energy that is produced from the electric power stations and flows through wires. (…………….)

4-The energy that is stored in both batteries and food. (…………….)

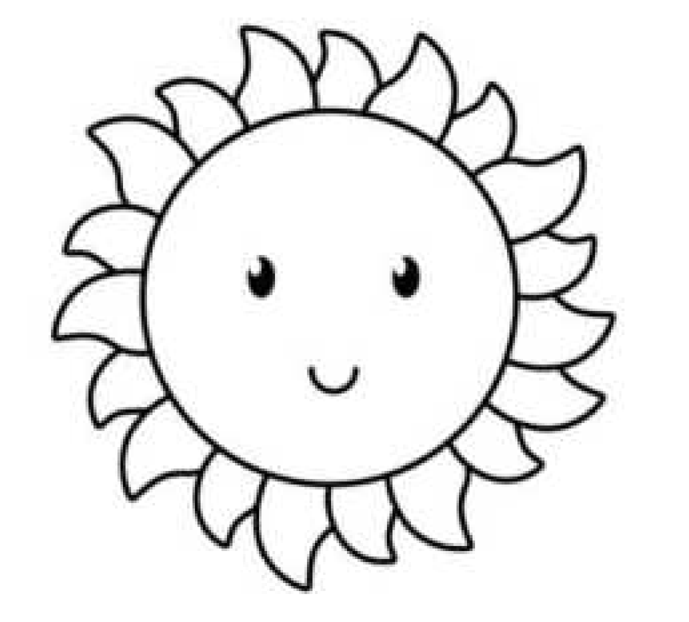
5-The energy produced when the wood of trees is burned. (…………….)





Concept 3-2 About fuel

-The main source of energy is the sun.

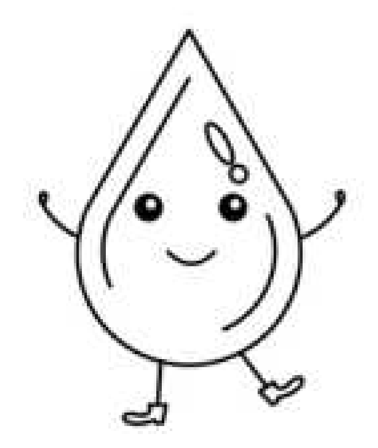


Types of energy resources

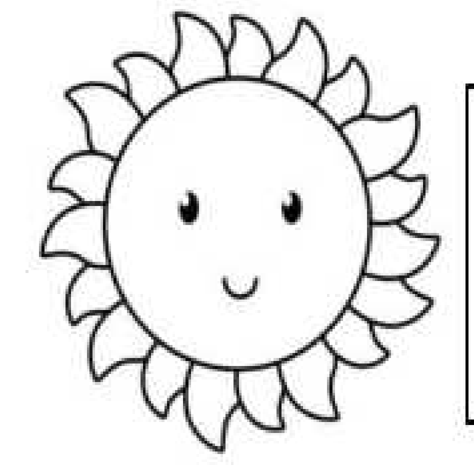
1) Renewable energy resources

-They are natural resources that can (renew) replace the part that has been consumed (used) which we used it to transform it into another form after a short time, so it will

Examples

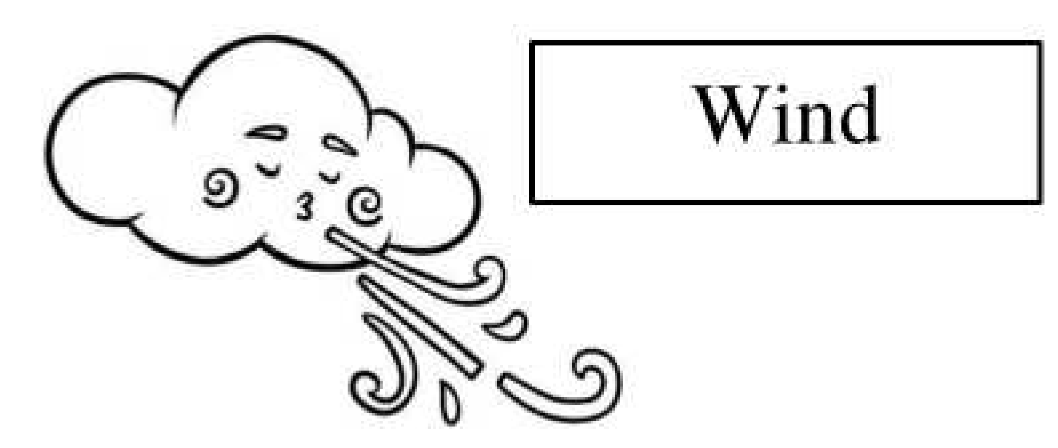


Water or hydroelectric energy



Sun

(solar energy)



Wind

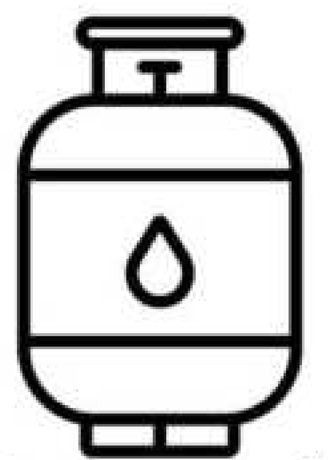
2) Non-renewable energy resources

-They are natural resources that cannot be (renewed) replaced in a short time, as we use it in a rate faster

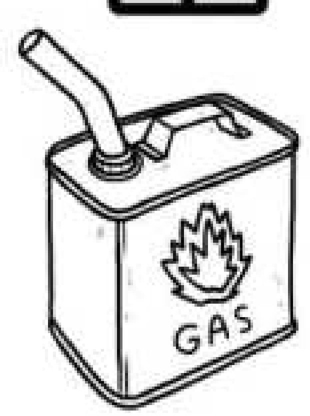
Examples



Coal



Natural gas



Gasoline made of (oil)



Fuel: it is any substance that produces thermal energy when it is burned

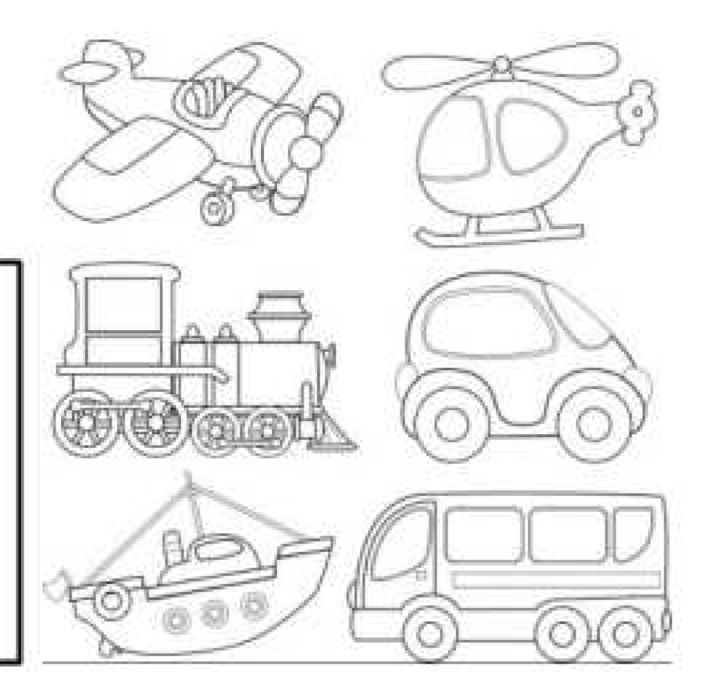
Examples: Coal, natural gas and gasoline (oil)

1) **Cooking food** by using coal, natural gas and wood.



2) **Generating (producing) electricity** by using gasoline(oil), natural gas and coal.

3) **Warming** by using coal and wood.



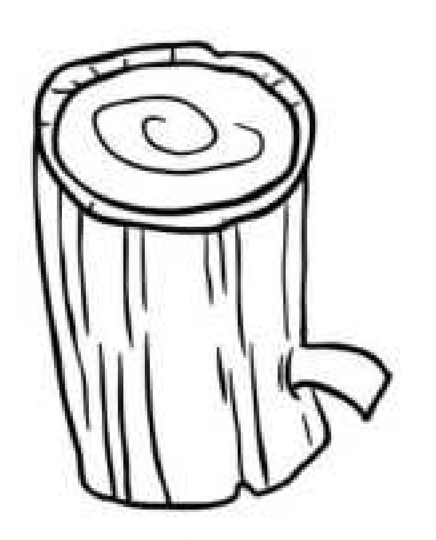
4) **Operating all means of transportations** (cars, trains… etc.) by using natural gas and gasoline(oil).

Types of fuel can be classified into:

1)Biofuel: produced from living organisms that can be planted (plants), and it is a renewable energy resource that is continually replaced when the plant grow (renewable fuel) and its primary source is the sun.

Examples

1)Wood: oldest fuel used in warming and cooking.



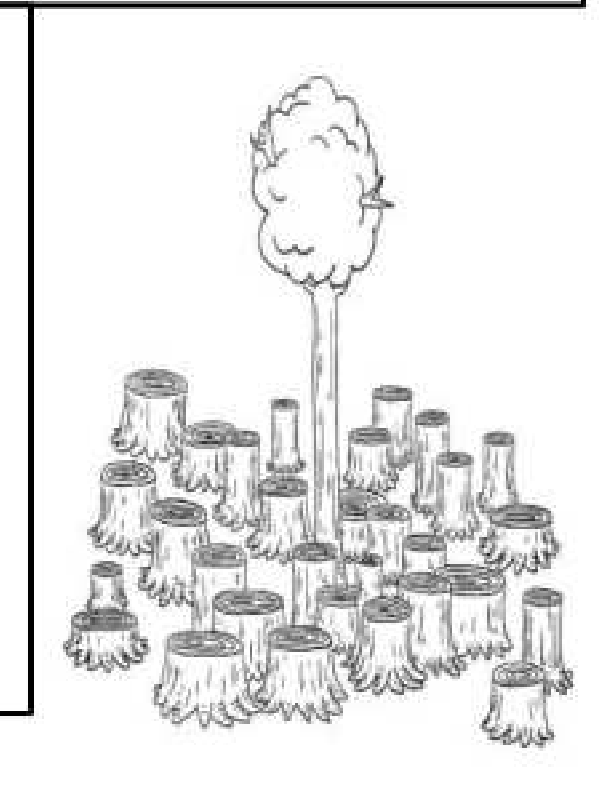
2) Charcoal: made from wood (when we burn wood it will be produced) (very important)



3) Some types of plants such as grass, corn and wood chips, they used to make liquid fuel.

Conservation (saving or keeping) (not to run out or not to be finished)of biofuel :Although biofuel is a renewable energy resource , it should be conserved (rationalized).

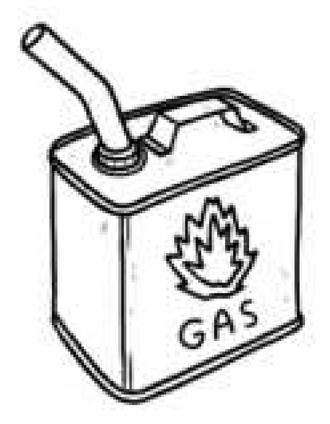
-Some people who use wood as a source of energy will cut down the trees rapidly (called deforestation) causes negative (bad) effect on the environment, so we need to use it wisely (continuously rationalized) so that it will not run out.



2) Fossil fuel: produced from old living organisms (plants or animals) that were died, buried and decomposed (changed into smaller parts) over a long period of time (millions of years), (non- renewable energy source) (runs out faster than it can be renewed) (its primary source is the sun)

Examples

1)Gasoline (oil) and natural gas (made from the decomposed remains of marine organisms(sea animals)



2) Coal: is formed when the remains of the plants were decomposed, so there is a difference between the coal and charcoal.

Conservation (saving or keeping) (not to run out or not to be finished)of fossil fuel : is a non-renewable energy resource , it should be conserved (rationalized), by using alternative (another) resources, because they cannot be easily renewed.





Formation of coal:

1)300 million years ago large areas of the earth were covered with swamps, with a lot of plants growing nearby

→ 2) When those plants died, their remains will decompose and covered by hundreds of meters of (mud and rocks)

→ 3) There is high (extreme) heat and pressure those remains will change into coal

Gasoline (Oil) and water

-Gasoline (Oil) and water are resources that are used by humans to generate energy, as Gasoline (oil) is a non- renewable resource and water is renewable resource.

-Oil has structure (shape) differs from water.

Formation of oil

1) When marine organisms died, their marine settle on the ocean floor (bottom).

→ 2) Over millions of years, layers of sediments and rocks cover the remains of them and this will cause an extreme heat and pressure.

↓ 3) Finally those remains converted into oil (Gasoline)







Conservation of oil: to avoid running out of the oil

1) Reduce the use of private vehicles (cars)

2) use public means of transportation (buses and trains)

Conservation of water: we should use it carefully

1) Avoid wasting or polluting water

2) Growing plants that do not need to large amount of water

Some methods of conserving fossil fuels

1) Walking or using bicycle instead of driving a car.
2) Replacing fossil fuels with renewable energy resources such as a)solar energy b) hydroelectric energy c) wind energy.

(Conservation of electricity)

1)Turning off the lights when you are not in the room

2)Un plugging electrical devices (appliances) when not in use.

How fossil fuel is used to produce electricity(electrical energy) in electric power stations (power plants)

1)Fuel burns -When the fuel burns it produces thermal energy	→	2)Steam rises - This thermal energy is used to heat water producing steam



3) Steam turns turbines

-the steam goes inside the tubes to operate turbines.

4)Turbines turn generators

-The movement of turbines produces kinetic energy which is used to operate the generator to transform it into electrical energy.

5) Electrical energy is transferred to homes

- Through cables (wires) to operate different devices.

-Using renewable energy resources is more expensive than using fossil fuels, so people will extract fossil fuels to operate and power everything around them.

So they will burn fossil fuels to generate electricity, some harms to the environment will be produced (due to carbon dioxide gas (produced during burning)).

Harms of burning of fossil fuels on the environment

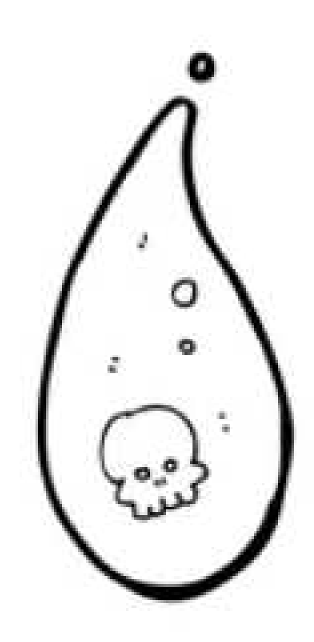
1)Acid rains: when carbon dioxide gas combine with water in the air it will form (carbonic acid) so when it rains it will bring this substance with it to us. So it causes

a)The death of trees

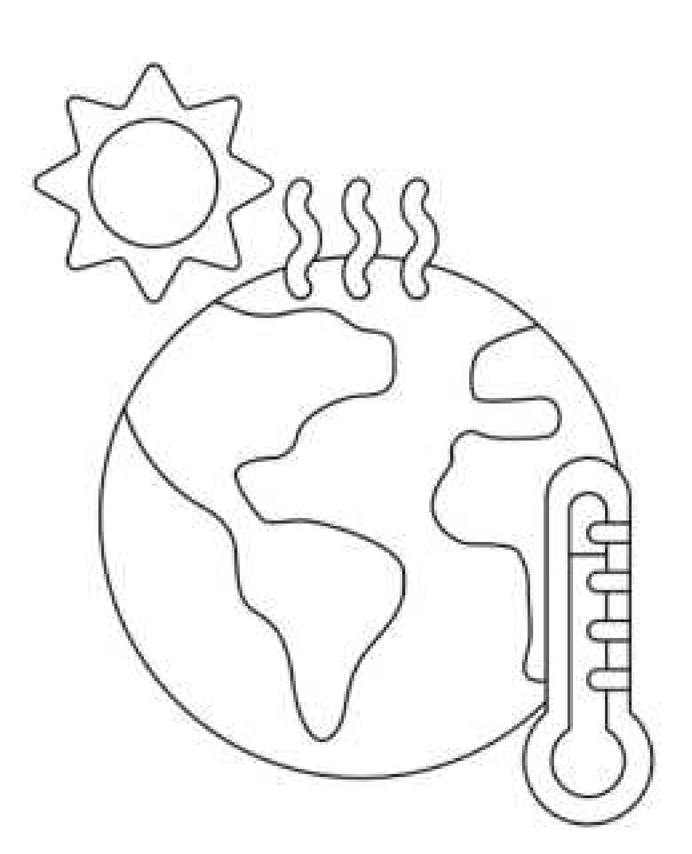
b) Decomposition (breaking) and dissolving of some rocks and bricks of buildings.

c)Chemical changes in the structure of lakes (water) causing the death of fish

d) Chemical changes in the structure of soil



2) Global warming: by increasing the amount of carbon dioxide gas in the air, it will form a layer in the atmosphere that traps heat above the Earth's surface, causing a raise in the temperature (and this is global warming).



-To reduce acid rains and global warming

We should reduce our consumption (usage) of energy, so the amount of burning fossil fuel and carbon dioxide will be reduced.

Some sources of pollution in big cities:

1) Burning fuels: produces smog, which pollutes the air
2) Pesticides: used on farms are mixed with water in canals and rivers , this leads to pollution of soil and water.
3) Using chemicals in factories pollutes the air, water and soil.

Some effects (impacts) of air pollution on human's health

1) Smog from cars cause irritation of our eyes and lungs
2) Smog contains tiny particles, o when we breathe it will enter our respiratory system and irritate the lungs and damage the tissues of the respiratory system.







Evaluation

Choose the correct answer:

1-In hydroelectric power, what is necessary for the production of electrical energy?

a)High amount of air

b)High intense sunlight

c)Dams filled with water

2-………… it is a substance that produces thermal energy when it is burned

a) Water b) coal c) wind energy

3- ………………………….. They are natural resources that can (renew) replace the part that has been consumed.

a) Renewable energy resources

b) non - Renewable energy resources c) gasoline

4- Burning fossil fuels produce ………………..

a) Oxygen gas b) carbon monoxide c) carbon dioxide

5- By …………………..the amount of carbon dioxide gas in the air, it will form a layer in the atmosphere that traps heat above the Earth's surface, causing a raise in the temperature.

a) Decreasing b) increasing

6-………………….. is the result of decomposing of plants.

a) Charcoal b) coal c) oil



Put (✓) or (x):

1- Cars needs source of energy to move. (   )
2- The fuel burns inside the car engine, allowing the engine to rotate the Wheels. (   )
3- The gases emitted by burning of fossil fuels pollute the environment. (   )
4- Using cars instead of bicycle is one way to conserve fossil fuel. (   )
5- Producing energy from renewable resources is less expensive than Producing energy from fossil fuels. (   )
6- The amount of fossil fuel on Earth planet is unlimited. (   )
7- Gasoline (oil) is a non- renewable resource and water is renewable resource. (   )
8- Acid rains causes chemical changes in the structure of lakes(water) causing the death of fish. (   )
9- Burning fuels: produces smog, which pollutes the air. (   )

Complete:

1)(living organisms –grass- renewable –oil- corn-non-renewable- the sun- millions of years –coal)

Points of comparison	Biofuel	Fossil fuel
Definition	produced from ……….that can be planted	produced from old living organisms that were died, buried and decomposed over……..
Primary source	……………………..	The sun
Renewable or non Renewable	………………………	………………………
Examples	Wood, ……….and……….	Natural gas,…...and….



Worksheet (1)

- **Choose the correct answer:**

1. Toy cars need energy to do all the following functions, except...........
a. moving forward and backward. b. rotation in a circle
c. moving right and left. d. rotation around the moon.

2. In the battery of a toy car .... energy changes into electrical energy
a. chemical b. sound c. light d. thermal

3. Electrical energy produced from a toy car battery can be changed into ....and .... energies.
a. mechanical - sound – solar b. mechanical - thermal - solar
C. mechanical - sound – thermal d. sound - thermal - solar

4. The energy source in a toy car is the ....
a. engine. b. tires. c. battery. d. fuel

5. It takes several........... for a spacecraft to travel from Earth to Mars.
a. months b. seconds c. minutes d. days

6. Curiosity rover is designed to explore.
a. the moon. b. the Sun. c. Earth planet. d. Mars planet.

- **Correct the underlined words:**

1. The solar energy produced from the moon can be converted into different forms of energy. (.........................)
2. Toy cars depend on fuel as a source of electrical energy. (.........................)
3. Curiosity is a robotic vehicle that is designed to explore the surface of moon. (..............................)

- **Complete the following sentences :**

1. The energy can be ………… From one form to another.
2. Remote controlled toy cars changes……………….energy stored in its batteries into……….. energy that in turn changes into………………. energy which is used to Move the car.
3. To operate an electric mixer we use …………… ………Energy.
4. When your cell phone is out of charge, you must rechange its……………To operate it again.
5. Some calculators can change solar energy into……………………Energy by using the Sunlight.

- **Put (✓) or (x) :**

1. Energy cannot be transformed from one form to another. ( )
2. We can convert the solar energy into different forms of energy. ( )
3. We can continue to move a toy car even after its battery runs out. ( )
4. Curiosity is a vehicle that travels across the surface of the planet Mars. ( )
5. Mars is located a few meters away from Earth. ( )
6. Without electrical energy, Mars rover curiosity cannot move or communicate With Earth. ( )

- **Give reasons for:**

1. Some calculators use the sunlight to be operated.
   ……………………………………………………………………………………………
   ……………………………………………………………………………………………
2. A remote controlled toy car needs battery to move from one place to another.
   ……………………………………………………………………………………………
   ……………………………………………………………………………………………

Worksheet (2)

- **Write the scientific term for each of the following:**

1. The main source of energy for most forms of energies on Earth.(……………………….)
2. The energy produced when the wood of trees is burned. (……………………….)
3. It is produced from the remains of dead trees buried under the Earth's surface over millions of years. (……………………….)
4. The energy that is used to operate an electric heater. (………………………….)
5. The energy stored inside the coal. (…………………………)

- **Complete the following sentences by using the words from brackets:**
  (electrical – kinetic -sun – light – thermal – kinetic – potential – sound – heat – kinetic – thermal)

1.The energy that is produced from the battery used to operate a toy car is …………..

2. When you press on the soap dispenser, you turn the ………….. energy stored in its spring into…………. energy that moves the soap upward.
3. The energies that are produced from the washing machine are…………… energy and …….. energy.
4. When you rub your hands together, the ………….. energy is converted into………..energy.
5. In any energy chain, some of the energy is lost in the form of………….
6. The electric lamp converts electrical energy into . ... energy and …. ……… energy.
7.The…………….. is the primary source of energy that is transferred to the food in the
Form of chemical energy.

- **What happens if…?**

1) You burn a piece of wood. (according to the change of energy).
   ………………………………………………………………………………………….
   ……………………………………………………………………………………….
2) You shake a small bell with your hand. (according to the change of energy).
   ………………………………………………………………………………………….
   ………………………………………………………………………………………….

- **Put (✓) or (x):**

1. In the soap dispenser, potential energy changes into kinetic energy. ( )
2. In the electric blender, sound energy changes into electrical energy and kinetic energy. ( )
3. Most of energy chains starts with the moon. ( )
4. Light energy from the Sun causes trees to grow. ( )
5. Both hair dryer and washing machine depend on the same kind of energy to be operated. ( )
6. In the electric power stations, the sound energy produced from burning of coal can be changed into electrical energy. ( )
7. There is energy loss when energy is transformed from one form to another. ( )
8. Energy can be destroyed inside some devices. ( )
9. Electric bulb depends on chemical energy to be operated. ( )
10. Both electric bulb and electric heater produce thermal energy. ( )

Worksheet (3)

- **Write the scientific term for each of the following:**

1. The energy produced from playing guitar. (…………………………….)
2. The energy produced from the electric lamp and affects our eyes. (……………………………….)
3. The energy used to play a drum. (……………………………….)

- **Choose the correct answer:**

1. In the electric water kettle, the electrical energy changes into............... energy that can warm the cold water inside it.
   a. sound. b. thermal. c. light d. kinetic.
2. Some kinetic energy is converted into………….energy due to friction of bike's tire With the road.
   a. light b. electrical c. potential. d. thermal
3. Both hair dryer and electric water kettle produce…………… energy
   a. Chemical b. thermal C. light d. potential
4. When you turn on a light bulb, the electrical energy travels through. ....until reaching the bulb.
   a. wires. b. glass c.wood d.plastic.

- **Complete the following sentences:**

1. When you ride a bicycle, the …………….energy stored in your body is converted into……………. Energy which causes the bicycle to move.

2. The electric lamp converts.............. energy into light energy and................energy.

3.The change of electrical energy into sound energy in the radio is an example that proves the law of ……………………

- **Give reasons for**

  1.You feel heat, when you put your hands near a lighted electric lamp.

  ……………………………………………………………………………………………………
  ……………………………………………………………………………………………………

  2- The presence of batteries inside a toy car.

  ……………………………… ………………………………………………………………
  ……………………………………………………………………………………………

- **What happens if……?**
  - You put your hands near the lighted lamp .

  ……………………………………………………………………………………………………
  ……………………………………………………………………………………………………

Worksheet (4)

- **Put (✓) or (x) :**

1. The produced sound energy helps the hair dryer to do its function. (   )
2. In waterfalls, the water that falls down has a kinetic energy.(   )
3. The input energy in a hair dryer is the chemical energy. (   )
4. The energy chain of a burning candle is :Chemical energy converted into Thermal energy. (   )

- **Write the scientific term:**

1. The wasted energy when using a mobile phone for a long time. (……………………)
2. A kind of energy that is produced from the electric heater and burning coal. (………………………)
3. The energy that is produced from the blender and helps it in doing its job. (…………………………)
4. The energy that is produced from the electric power stations and flows through wires. (…………………………)

- **Choose the correct answer:**

1. The input energy when using the hair dryer is the ………… Energy.

a. electrical   b. potential   c. kinetic   d.thermal

2. During the running of a player, the chemical energy inside his body is converted Into ……….. and…………energies.

A. potential-light.   B. kinetic- light.   C . thermal- kinetic.
D. thermal – light

3. The output energy when playing drums is the ……….. energy.
   a. chemical   b. light   C. sound.
   d. potential
4. When a piece of coal is burnt,……………………. Energy is produced.

a.Thermal   b. Kinetic   c. Sound   d. Potential

- **What happens if… ?**

1- You turn on an electric fan. (according to the change of energy).

………………………………………………………………………………………………………
………………………………………………………………………………………………………

2- use a mobile phone for a long time. (according to the wasted energy).

………………………………………………………………………………………………………
………………………………………………………………………………………………………

- **Give reasons for:**

- Thermal energy in mobile phone is considered as a wasted energy.

………………………………………………………………………………………………………
………………………………………………………………………………………………………

- Sound energy and thermal energy are considered as wasted energy in the blender.

………………………………………………………………………………………………………
………………………………………………………………………………………………………

Worksheet (5)

- **Correct the underlined words :**

5. Fuel is the substance that produces electrical energy on burning. (……………………….)
6. We need sound energy, for cooking foods and warming houses. (…………………………)

- **Put (✓) or (x) :**

5. Both coal and wood produce energy on burning them. (   )
6. You need gasoline to move a bicycle.   (   )
7. We cannot drive a car that doesn't contain fuel . (   )
8. As the speed of the car increases, the amount of used fuel decreases. (   )

- **Choose the correct answer:**

1- We can use the energy obtained from burning of wood in all of the following situations, except ……………

a. warming houses.   b. operating television.   C. cooking food   d. boiling water.

2- All the following are found deeply under the Earth's surface, except…………….

a. Natural gas.   b. Coal.   c.Green plants.   d.Oil

3- Among forms of fuel that present in car fuel stations are………..

A. Gasoline and wood.   B. natural gas and coal.

C. wood and coal.   D. gasoline and natural gas.

- **Complete the following sentences :**

1) Gasoline burns inside a car engine to produce………………. energy that is changed Into…………………energy which causes the movement of the car.
2) We can use some forms of fuel such as………….and……………in warming houses.

- **Give reasons for:**

- fuel is very important for different means of transportation

……

……

-Sometimes the fuel indicator of a car goes down.

……

……

-Gasoline burns inside a car engine.

……

……

Worksheet (6)

- **Choose the correct answer**

1. All the following are forms of fuel, <u>except</u>………………

   A. wood. b. natural gas. C. gasoline. d. glass.

2. All the following are renewable resources of energy, except………

a. natural gas b. water. C. the Sun. d wind.

3.Coal is formed under the Earth's surface……….. from the remains of

A. dead animals. b. dead plants. C. dead humans. d. dead insects.

4.Wood is considered as………..

a. biofuel. b. fossil fuel. C. liquid fuel. d.gaseous fuel.

5.Extreme heat and pressure under the Earth's surface has an important role in Forming.

a. wood. b. wind. C. Fossil fuel. d.biofuel

- **Complete the following sentences**

1. Water and………………are considered from…………. resources of energy, while Coal and……..,………..are from non-renewable resources of energy.
2. Wood chips and grass can be used to make a ………………….. biofuel .
3. Different forms of fuel can be classified into two main types which are ……………..and…………..
4. The natural resources that are consumed at a rate faster than they can be Renewed are called……………. ……….Resources of energy.

- **Correct the underlined words:**

1. We have to increase planting vegetables and fruits that need a large amount of water.(……………………….)
2. The moon is the primary source of both biofuel and fossil fuel.(…………………………..)
3. We can use some animals, to make a liquid biofuel. (………………………..)
4. The rate of consumption of fossil fuel, must be increased. (…………………………….)
5. Wood is a form of fossil fuel, that can be used in houses. (…………………………….)

- **Put (✓) or (X) :**

1. Biofuel is one of non-renewable resources of energy. ( )
2. Extreme cooling under the Earth's surface, helps in the formation of oil . ( )
3. The Sun is the primary source of forming both biofuel and fossil fuel. ( )
4. We have to reduce the usage of the Sun as a source of energy. ( )
5. We can make a liquid fuel from grass and wood chips. ( )

- **Read the following paragraph, then choose the correct answer :**

Nowadays , we use gasoline and natural gas in means of transportation which are
considered fossil fuels, while we can use coal which is a fossil fuel and also wood
which is a biofuel in warming our houses.

1.………………..is a non-renewable resource of energy, that is considered as a fossil fuel
And it is not used in means of transportation nowadays.

A. Water. B. Coal C. Wind d. Gasoline

2. A type of biofuel, which is used in warming houses and cooking food is ………….

a. wood b. wind. C. water. d. sand.

3. A type of fossil fuel, which is formed from decomposition of plant remains is ....

A. wood b. sand. C. wind. d. coal.

Worksheet (7)

- **Put (✓) or (X) :**

1. We have to conserve all forms of fuel. ( )
2. Burning of fossil fuel inside electric power station produces Potential energy. ( )
3. Turning off lights that we do not need, is a way to conserve electricity. ( )
4. Any form of fossil fuel must be formed under the Earth's surface. ( )

- **Arrange the following steps to show how electricity is generated in electric Power station and sending it to houses and factories:**

(..........)Steam turns turbines that produce kinetic energy.
(..........)Fuel burns and produces thermal energy.
(..........)Electrical energy sent to houses and factories.
(..........)Water becomes hot and produces steam.
(..........)Turbines turn generator that produces electrical energy.

- **Write the scientific term:**

1-The matter that produces steam on heating, which is used to turn turbines in Electric power station. (.............................)
2-The type of fuel that is used inside the electric power station to produce Electricity . (...........................)
3-The device in the electric power station, that produces kinetic energy to operate Generators. (.............................)

- **Correct the underlined words:**

1. Fossil fuel include oil, coal and wood. (.........................)
2. Hydroelectric energy, is one of non-renewable energy resources. (...........................)
3. In electric power station, water turns turbines that produce kinetic energy. (...............................)

4. After death of living organisms, their remains are buried under the Earth's surface and exposed to
5. extreme pressure and cool.(…………………………)

- **Choose the correct answer:**

1. Inside the electric power station, heating of ……….. produces steam.
   A. turbines b. generators C. water d. fuel
2. All the following are used to generate electrical energy, except……….
   A. Oil .B. natural gas. C. waterfalls. D. rain water.

3.Hydroelectric energy is generated from. ……………
a. waterfalls only. B. waterfalls and dams.
C. biofuel only. d. biofuel and fossil fuel.

4. All the following are forms of fossil fuel, except ………….
a. water. b. coal. C. natural gas. d. oil.

5.Which of the following forms of fuels can be manufactured by man?
A. Oil and natural gas. b. Oil and charcoal.
C. Natural gas and ethanol. d. Charcoal and ethanol.

6.All the following factors play an important role in the formation of fossil fuel, except …………….

A. extreme pressure. b. extreme heat.
C. The moon light. d. rocks and sediment.

Worksheet (8)

- **Choose the correct answer :**

1.Cars smog cause irritation of……… of humans.

a. stomach and eyes b. eyes and lungs c. small intestine d. large intestine

2. Acid rain is formed when………..Combines with rain water.

A. oxygen gas b. carbon dioxide gas C. dust d. sand

3. All the following are harmful effects of acid rain, except.

a. global warming. b. death of trees. c. chemical changes in lakes. d. chemical changes in the soil.

- **Complete the following sentences by using the words : (Acid - Fish - soil - carbon dioxide – smog)**

1. Acid rain leads to chemical changes in the structure of lakes causing death of ………………..
2. Burning of coal and oil produce …………………… gas .
3. Chemical changes in the structure of…………………Due to…………..Rain .
4. Tiny particles found in …………………lead to air pollution .

- **Put (✓) or (X):**

1.Acid rain helps trees to survive. ( )

2. Global warming increases the decomposition of some rocks . ( )

3. Rain water can be mixed with both pesticides and carbon dioxide gas. ( )

- **Write the scientific term of each of the following:**

1. It is the system that its tissue is damaged due to breathing big amount of cars smog. (……………………….)
2. It is a phenomenon in which the Earth's temperature increases when carbon dioxide gas increases in the air. (…………………………….)
3.

Worksheet (9)

- **Give one example for each of the following :**

1. A method of conserving fossil fuel.
   …………………………………………………………………………………………………
2. Anon-renewable resource of energy.
   …………………………………………………………………………………………………
3. An advantage of using renewable resources to produce energy.
   …………………………………………………………………………………………………

- **Correct the underlined words:**

1. The amounts of <u>renewable resources</u> of energy are limited on Earth. (……………………)
2. Gases emitted from fossil fuel on burning <u>decrease</u> the temperature on Earth. (…………………..)
3. Gases emitted from burning fossil fuel always <u>clear</u> the air. (………………………)

- **Give reasons for:**

1. To keep the air clean we must replace fossil fuel with renewable resources of Energy
   …………………………………………………………………………………………………
   …………………………………………………………………………………………………

- What happens if .. ?

1. Using renewable resources of energy instead of fossil fuel. (according to Earth's temperature)
   …………………………………………………………………………………………………
   …………………………………………………………………………………………………
2. People don't rationalize their using of fossil fuel.
   …………………………………………………………………………………………………
   …………………………………………………………………………………………………

Exercises1

(A) Choose the correct answer:

1. To move a car, the fuel must be .... at first.

a. freezed.

b. cooled

c. burned inside the car engine

d. removed from the fuel tank

2. During driving a car for a long distance, which of the following sentences describes the most important thing for the driver?

a. The presence of a speedometer.

b. The presence of a radio.

c. The fuel tank contains enough amount of gasoline.

d. The fuel tank contains a little amount of gasoline.

3. On burning fuel we obtain

a. sound energy.

c. electrical energy.

b. potential energy.

d. thermal energy.

(B) Give a reason for the following :

The importance of wood and coal in our houses.

....

....

(A) Put (√) or (×) :

1. Energy that is produced from burning gasoline, cannot be used to move a car. (   )

2. Burning of all forms of fuel produces thermal energy. (   )

3. If the fuel decreases in a car during driving, the driver must stop at the nearest fuel station to supply the car with gasoline. (   )

(B) Mention three different forms of fuel.

....

....

Put each of the following words in front of the suitable sentence:

[The Sun - Wood - Gasoline - Thermal energy]

1. It is a form of fuel that is used in different means of transportation. (...................)

2. It is a form of fuel that is used in warming houses.

(...................)

3. It is a form of energy which is produced from burning fuel.

(...................)

4. The main source of most energies on the Earth's surface.

(...................)



(A) Choose the correct answer:

1. Car engines can be operated by ....

a. coal only.

b. coal and wood.

c. gasoline only.

d. gasoline and natural gas.

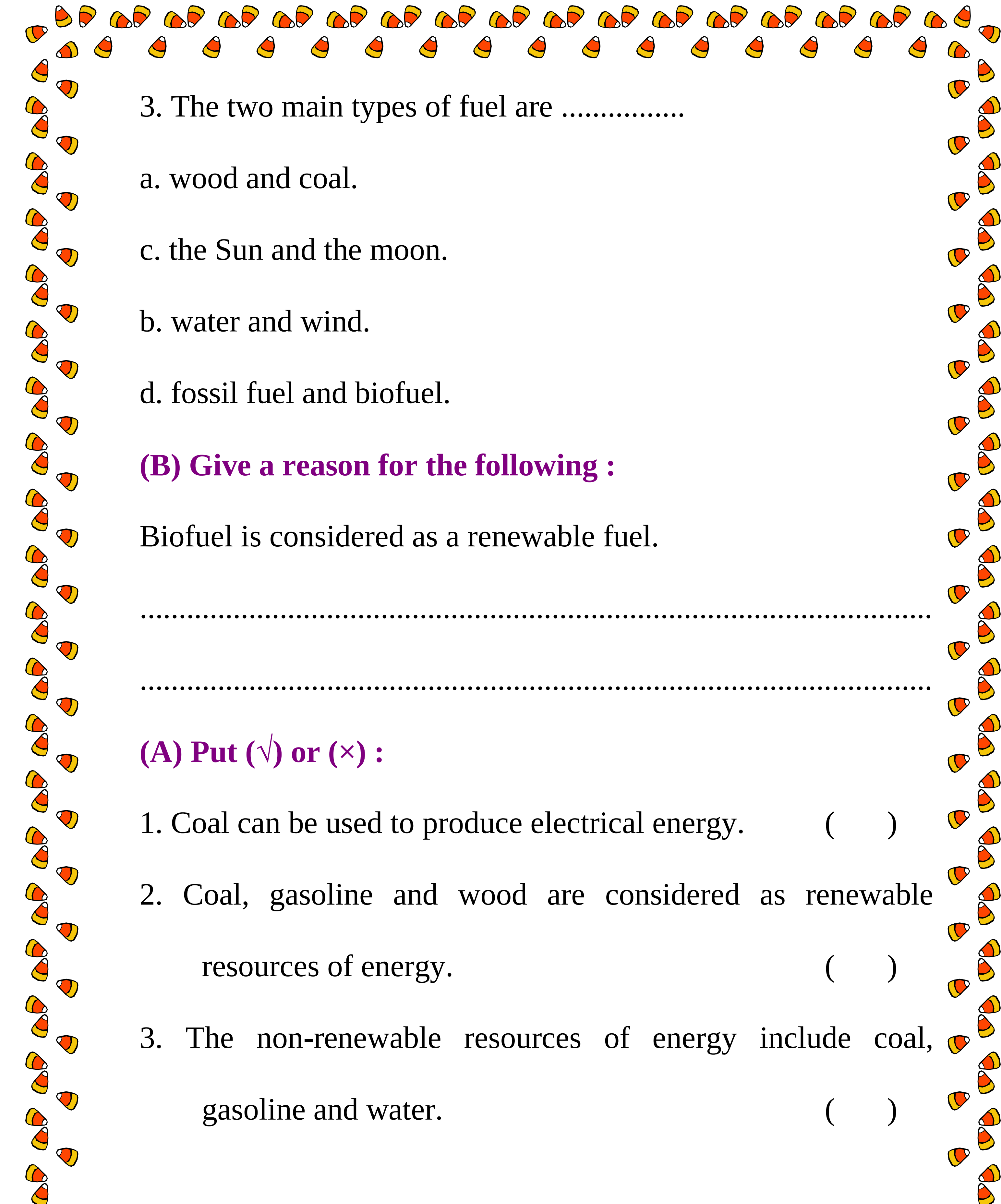
2. The fossil fuel are formed under the Earth's surface from dead plants or animals, after a .... period of time.

a. very short

b. short

c. very long

d. long



3. The two main types of fuel are ....

a. wood and coal.

c. the Sun and the moon.

b. water and wind.

d. fossil fuel and biofuel.

(B) Give a reason for the following :

Biofuel is considered as a renewable fuel.

....

....

(A) Put (√) or (×) :

1. Coal can be used to produce electrical energy. ( )

2. Coal, gasoline and wood are considered as renewable resources of energy. ( )

3. The non-renewable resources of energy include coal, gasoline and water. ( )

(B) What happens if ... ?

Marine organisms were buried under the Earth's surface over millions of years.

....

....

Choose from column (B) what suits it in column (A) :

(A) Form of fuel	(B) We can get it from
1. Wood 2. Gasoline and natural gas 3. Coal 4. Liquid biofuel	a. wood chips and grass. b. cutting of trees. c. decomposition of marine animals. d. decomposition of plant remains. e. boiling water.

1. .... 2. .... 3. .... 4. ....



(A) Choose the correct answer:

1. To produce steam inside the electric power station, we have to ....

a. cool the water.

b. freeze the water.

c. heat the water.

d. cool the fuel.

2. The devices in the electric power station which operated by steam are ....

a. the generators.

b. the turbines.

c. the tubes.

d. the cables.

3. The generator inside the electric power station, turns ....

a. water into steam.

b. steam into water.

c. electrical energy into kinetic energy.

d. kinetic energy into electrical energy.

(B) What happens if ..... ?

An electric generator in a power station is damaged.

....

....

(A) Put (√) or (×) :

1. The function of turbines in electric power station is similar to that of generators. (   )

2. Turbines convert kinetic energy into electrical energy.(   )

3. The electrical energy that is produced from electric power station, can be used in houses, streets and factories.(   )

(B) Complete the following sentences by choosing the correct answer from those between brackets :

1. Fossil fuel are [non-renewable - renewable] resources of energy which are used to generate electrical energy.
2. Turbines in electric power stations are operated by the effect of [steam - sand].
3. Electrical energy travels from electric power stations to houses through [cars - cables].

B From your understanding of how electricity is generated in electric power stations. Put each of the following words in front of its suitable sentence:

[Coal - Steam - Turbine - Generator}

1. Its movement produces kinetic energy. (.............)
2. It changes kinetic energy into electrical energy. (.............)
3. It is a type of non-renewable resources of energy. (.............)
4. It is resulted from heating the water and it turns turbines. (.............)



(A) Choose the correct answer:

1. When carbon dioxide gas increases, the Earth's temperature ....

a. decreases slowly.

b. increases slowly.

c. decreases fastly.

d. doesn't change.

2. All forms of fossil fuel are formed ....

a. above the Earth's surface.

b. under the Earth's surface.

c. above the water surface.

d. in the air around us.

3. We have to protect stones of buildings from ....

a. global warming.

b. oxygen gas.

c. acid rain.

d. carbon dioxide gas.

(B) Give a reason for the following :

Burning of coal and oil causes the increase of the Earth's temperature.

....

....

(A) Put (√) or (×) :

1. Acid rain causes global warming. (   )
2. Mixing of water with oxygen gas produces carbonic acid. (   )
3. Acid rains have negative effects on both soil and water of canals. (   )

(B) What happens if ..... ?

Some people live in a city that has too much cars smog.

(according to the human health).

....

....

Scientists do some experiments to know the bad effects of some different sources of pollutions on different living organisms.

Match each experiment with its correct observation :

The experiment	The observation
1. Exposing a dog to cars smog for a few minutes 2. Placing a building stone in a cup contains a sample of acid rain for a long period of time 3. Watering a small plant with acid rain for a week	a. its leaves turn brown and it will die. b. irritation of its eyes and lungs. c. it -will decompose into small rocky particles.

1. ....2. .... .3.......................



(A) Choose the correct answer:

1. The energy that originally causes the formation of the non-renewable fuels is ....

a. wind energy. b. water energy.

c. solar energy. d. electrical energy.

2. As the time passes, the amount of coal will ....

a. increase. b. decrease.

c. remain constant. d. increase then decrease.

3. Burning of fossil fuel produce....................

a. only gases that pollute the air.

b. only thermal energy.

c. gases that pollute the air and solar energy.

d. thermal energy and gases that pollute the air.

(B) Give a reason for the following :

Burning fossil fuel causes global warming phenomenon.

....

....

(A) Put (√) or (×) :

1. Renewable forms of fuel can be replaced faster than non-renewable forms of fuel. ( )
2. Burning fossil fuel produces gases that don't cause global warming. ( )
3. Burning coal emits gases which cause air pollution. ( )

(B) What happens if ...?

The amount of gases produced from burning of fossil fuel increases to very high limit.

(according to Earth's temperature)

....

....

Complete the following paragraph by using the following words:

[global warming - heat - raises - gases]

From disadvantages of using fossil fuel is that when it is burned, it emits .... that cause air pollution and .... trapping in the atmosphere, which .... the temperature on the Earth, that causes .... phenomenon.

Model Exam

(A) Complete the following sentences:

1. Some forms of fuel can be used in cooking such as ....,............. and ....

2. The electric generator changes .... energy into .... energy.

3. Using the .... resources of energy is more expensive than using fossil fuel.

4. Different forms of fuel can be classified into two main types which are .... and ....

(B) Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Water 2. Wind energy 3. Coal	a. it needs extreme heat and pressure to be form from remains of dead plants. b. it is the main resource of energy on the Eart surface. c. it is a gaseous renewable resource of energy. d. it is a liquid renewable resource of energy.

1. .... 2. .... 3. ....

(A) Correct the underlined words :

1. Fuel is the matter that produces <u>electrical energy</u> on burning. (.....................)

2. Wood is a form of <u>fossil fuel</u>, that can be used in houses. (.....................)

3. Hydroelectrical energy, is used to produce <u>water</u> from waterfalls and dams. (.....................)

4. Gases emitted from burning fossil fuel always <u>clear</u> the air. (.....................)

(B) What happens if ....?

We use renewable resources of energy instead of fossil fuel

(according to Earth's temperature)

....

....

(A) Put (√) or (×) :

1. Wind energy will run out faster than natural gas. (   )

2. Turning off lights that we do not need, is a way to conserve electricity. (   )

3. We can make liquid biofuel from wood chips and grass.(   )

4. As the speed of the car increases, the amount of used fuel decreases. (   )

(B) Arrange the following steps to show how electricity is generated in electric power station and sending it to houses and factories:

(.......) Steam turns turbines that produce kinetic energy.

(.......) Fuel burns and produces thermal energy.

(.......) Electrical energy sent to houses and factories.

(.......) Water becomes hot and produces steam.

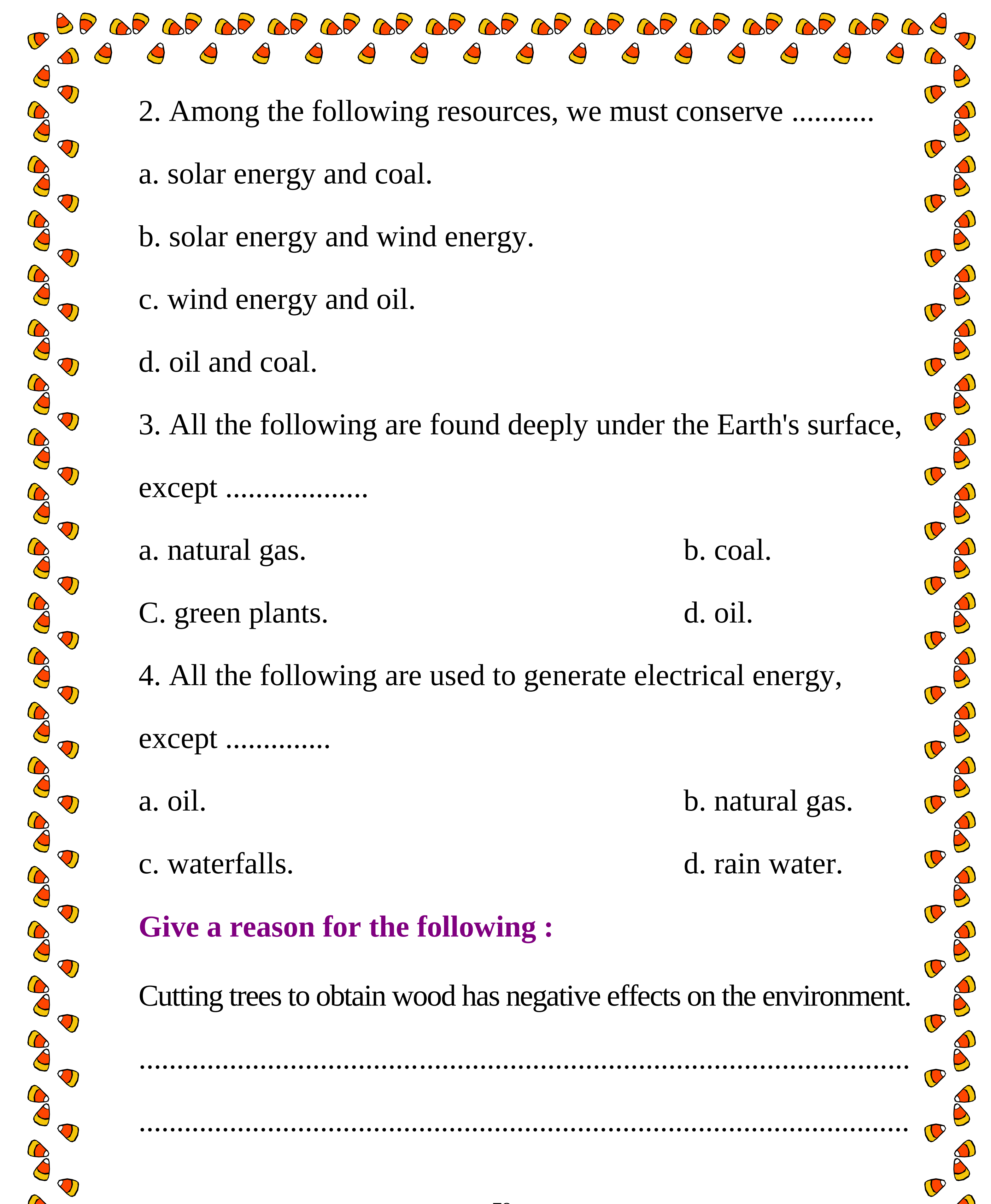
(.......) Turbines turn generator that produces electrical energy.

(A) Choose the correct answer :

1. Coal is formed under the Earth's surface from the remains of.................

a. dead animals. b. dead plants.

c. dead humans. d. dead insects.



2. Among the following resources, we must conserve ....

a. solar energy and coal.

b. solar energy and wind energy.

c. wind energy and oil.

d. oil and coal.

3. All the following are found deeply under the Earth's surface, except ....

a. natural gas. b. coal.

C. green plants. d. oil.

4. All the following are used to generate electrical energy, except ....

a. oil. b. natural gas.

c. waterfalls. d. rain water.

Give a reason for the following :

Cutting trees to obtain wood has negative effects on the environment.

....

....

Exercises1

(A) Put (√) or (×) :

1. The solar vehicle changes sound energy into kinetic energy. (   )
2. Mars rover curiosity can be operated from a distance.(   )
3. The stored energy in batteries is the light energy. (   )

(B) Give a reason for the following :

Curiosity robot uses the sunlight and batteries for its operation.

....

....

(A) Write the scientific term of each of the following :

1. The main source of energy on the Earth. (.................)
2. The form of energy that is stored in battery of a remote controlling toy car. (.................)

3. The remote controlling vehicle that is used to explore the surface of Mars planet. (.................)

(B) Mention two devices can be operated from a distance by using a remote control.

....

....

Look at the opposite figure, then choose the correct answer:

1. This car needs .... to move.

a. water. b. wood

c. fuel. d. energy

2. To keep playing with the toy car when the battery runs out, we have to .... or recharge the battery.

a. heat. b. cool

c. replace. d. freeze

3. The type of energy that is used in operating this car is .... energy.

a. sound. b. light

c. thermal. d. electrical



(A) Complete the following sentences:

1. When you rub your hands together, the consumed energy is .... energy, while the produced energy is ....energy.

2. The produced energy in a toy car is .... energies in a hair dryer are .... energy, while the produced energy and sound energy.

3. The produced energy from coal is .... energy, that is converted into .... energy used to operate the machines of electric power stations.

(B) Give a reason for the following :

The thermal energy produced from burning coal is used in some electric power stations.

....

....

(A) Put (√) or (×) :

1. Curiosity robot needs sound energy to be operated. (   )

2. The electric lamp is the primary source of most energies on the Earth. (   )

3. The electric iron converts electrical energy into thermal energy. (   )

(B) What happens if ... ?

You press on the spring of the soap dispenser.

(according to the change of energy).

....

....

Look at the opposite figure, then complete the following sentences:

1. This living organism can converts .... energy of the Sun into .... energy stored inside it.

2. If the wood of this organism is burned, ... energy is produced.

3. After death and burying of this organism over millions of years, it becomes coal that stores .... energy.

4. The formed coal can used in electric power stations to generate .... energy.





(A) Choose the correct answer :

1. Mars rover curiosity uses .... to be operated.

a. solar energy and electrical energy

b. solar energy and thermal energy

c. electrical energy and thermal energy

d. electrical energy and sound energy

2. While playing a drum, ... energy changes into .... energy.

a. sound - kinetic

b. sound - light

c. kinetic - sound

d. kinetic - light

3. In the bicycle, the kinetic energy is converted into .... energy due to the friction of its tires with the road.

a. sound. c. light

b. thermal. d. chemical

(B) What happens if ... ?

You rub your hands together.

(according to the change of energy).

....

....

(A) Correct the underlined words :

1. Energy can neither be created nor destroyed, but only converted from one form to another, this is the law of <u>consuming</u> of energy. (   )

2. The consumed energy while burning some pieces of wood is the <u>thermal</u> energy. (   )

3. The lighted lamp produces chemical energy that makes you feel warmth when you put your hands near it. (   )

(B) Mention two devices that convert electrical energy into both kinetic and sound energy.

....

....

Look at the following figures, then complete the following sentences.



Device (1)

Device (2)



Device (3)



Device (4)

1. The electrical energy used to operate devices number ....,............... and ....

2. Kinetic energy is produced in devices ....and.............



(A) Complete the following sentences:

1. The output energy of burning coal is .... energy, which is used to produce .... energy in electric power stations.

2. The output energy that helps the washing machine to do its main function is .... energy, and this energy is considered the .... energy of the hand bell.

3. The input energy of the toy car is .... energy that is stored in its battery and then converted into .... energy in its wires to operate its motor.

(B) Give a reason for the following :

Sound energy and thermal energy are considered as wasted energy in the washing machine.

....

....

(A) Write the scientific term of each of the following:

1. The input energy of a television. (..........)

2. The wasted energy of a computer. (..........)

3. The output energy of the washing machine which helps it to do its main function. (..........)

(B) Mention the input and output energies of the opposite device:



1. Input energy: ....

2. Output energy : ....

13 Look at these electric devices, then complete the following sentences :



Device (1)



Device (2)



Device (3)

1. Sound and light energies are produced in the device number .... and help it to do its function.

2. Kinetic energy is produced in devices number .... and ....

3. Noise from devices number .... and .... is wasted energy, because sound doesn't help the devices functions.

4. All of these devices are operated by .... energy that is transmitted from .... stations through wires.

Model Exam

(A) Choose the correct answer:

1. Mars rover curiosity is designed to explore ....

a. Earth planet. b. Mars planet.

c. the Sun. d. the moon.

2. Plants can convert the light energy from the Sun into .... energy which is stored inside the plant in the form of sugar.

a. sound. b. electrical

c. chemical. d. kinetic

3. When a piece of coal is burnt, ... energy is produced.

a. thermal. b. kinetic

c. sound. d. potential

4. Inside a light bulb, electrical energy changes into .... and .... energies

a. sound – light. b. sound - thermal

c. kinetic – light. d. light - thermal

(B) What happens if you put your hands near a lighted lamp ?

....

....

(A) Put (v) or (x) :

1. There is a stored chemical energy inside the food we eat. (   )

2. The input energy in a hair dryer is the chemical energy.(   )

3. As a result of friction between bike's tire and the road, kinetic energy changes into chemical energy. (   )

4. We can convert the solar energy into different forms of energy. (   )

(B) Look at the following figures, then complete the following energy chain



Figure (1)



Figure (2)



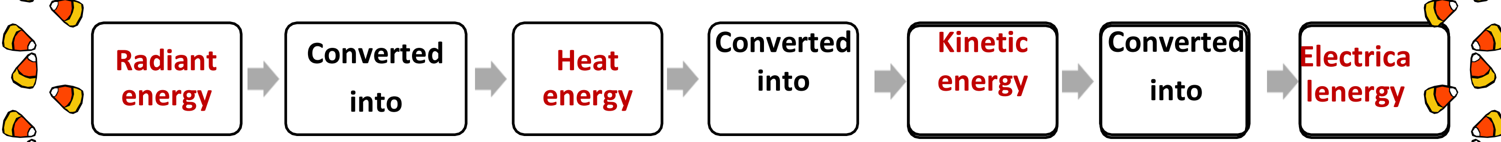
Figure (3)



Figure (4)



Figure (5)



(A) Correct the underlined words :

1. Light energy is stored inside the battery of a mobile phone. (................)

2. Toy cars depend on fuel as a source of electrical energy. (................)

3. Light energy, thermal energy and chemical energy are produced when a mobile phone is used. (................)

4. The solar energy produced from the moon can be converted into different forms of energy. (................)

(B) Give a reason for the following :

When you press on the spring of soap dispenser, the soap moves upward .

(according to the change of energy)

....

....

(A) Write the scientific term of each of the following:

1. The energy that is used to operate a television. (...............)

2. Energy can neither be created nor destroyed, but only converted from one form to another. (...............)

3. A kind of energy that is produced from the electric heater and burning coal. (...............)

4. The energy produced from playing guitar. (...............)

(B) Choose from column (A) what suits it in both columns (B) and (C) :

(A) Energy used	(B) The device	(C) Energy Produced
1. Kinetic energy	a	A. Thermal energy.
2. Electrical energy	b	B. Chemical energy.
3. Solar energy	c	C. Sound energy.

1. .... ⟶ 2. .... ⟶ 3. .... ⟶